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December 1979

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COVER: Skylab Astronaut CDR (now CAPT) Joseph P. Kerwin, MC, USN, suited and ready to leave for the Kennedy Space Center launch complex. —NASA photo
Story on page 2.

A Measure of Our Readiness

The naval service, the Navy and Marine Corps, has always been among the first United States forces to respond in any national emergency. On these occasions, the Medical Department of the Navy demonstrated its readiness and responded with alacrity.

Our readiness to respond has always been a source of pride to us, and justifiably so.

During times of peace we train in our hospitals, clinics, and schools, sharpening our skills and preparing ourselves. We work very hard and the results of our efforts have been proved repeatedly. We can expect to be challenged again so let us consider, briefly, our readiness.

During 1978 we had the opportunity to measure our ability to respond to a crisis. Through an exercise called *Nifty Nugget*, we explored readiness issues, identifying those areas where we might improve, and developing actions to accomplish these improvements.

With the impetus of *Nifty Nugget* we were able to identify potential conflicts in personnel management during crises. The Marine Corps must be augmented with medical personnel to bring it to combat strength before deployment. Augmentation is managed by the Bureau of Medicine and Surgery. Mobilization, which is managed by the Navy Military Personnel Command (NMPC), can occur before, during, or after the Marine Corps is augmented, creating havoc in the personnel management system. This occurs when both BUMED and the NMPC start writing orders on the same personnel. This was a major problem and it has now been resolved. Augmentation of the Marine Corps has the highest priority.

During *Nifty Nugget* we were reminded again of the essentiality of surgical team supply block readiness. Reserve surgical teams are mobilized and espoused to the surgical team supply blocks maintained by the medical centers. The mobilized teams must immediately be ready for reassignment as the situation requires. It is very clear from this example why surgical team supply blocks must receive as much attention as is required to maintain the blocks at 100 percent readiness.

Exercise *Nifty Nugget* gave us the opportunity to include all Medical Department commands in realistic exercise play. The response was excellent.

There will be more exercises like *Nifty Nugget*. To prepare for these exercises and to insure our readiness for actual contingency operations, several initiatives have begun.

During the last year, personnel requirements to support contingency operations have been identified. Training for those requirements has been considered and curricula are being developed.

Specific contingency skills, such as methods of triage and care for mass casualties, are being incorporated into the training requirements for certain categories of personnel.

Plans are being developed for courses of instruction to indoctrinate Medical Department personnel in both peace and wartime contingency skills.

Mobile Medical Augmentation Readiness Teams (MMART), the new, rapid response surgical and support teams concept, will have a training package soon. This innovative training concept will employ inservice training, exercises, and actual deployments to guarantee readiness to support either peace or wartime contingencies.

I believe it is clear from the activities, exercises, and initiatives discussed here that I am deeply concerned about our readiness in the Medical Department. You too must show your concern by maintaining your professional skills and your physical fitness, by keeping your immunizations current, and by keeping your personal affairs in order.

Readiness requires effort from everyone. Readiness is a responsibility and an obligation we must all seek to fulfill.

This is my goal and it should be yours.

W. P. Arentzen

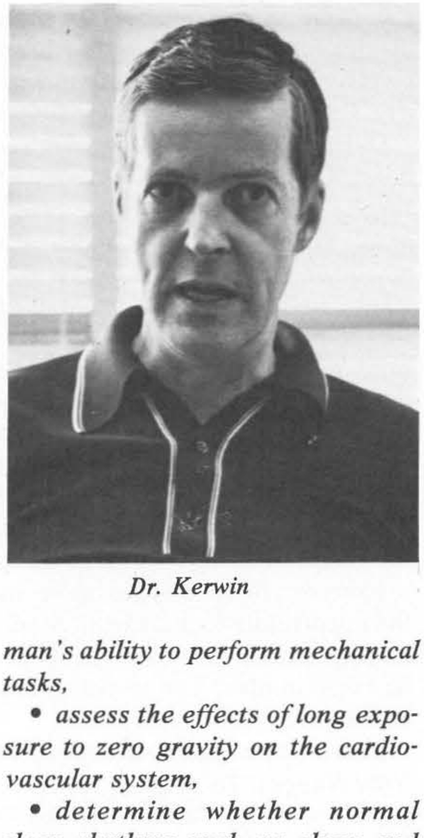
W.P. ARENTZEN
Vice Admiral, Medical Corps
United States Navy

NASA Astronaut is a Navy Medical Officer and the First American Physician in Space

Before it plunged to earth in a shower of flaming pieces last summer, the Skylab spacecraft served as home, workshop, and orbiting laboratory for three U.S. crews. The 118-foot-long, 100-ton vehicle contained 13,000 cubic feet of living and working space, about the same interior living space as a three-bedroom house. There were private sleeping compartments for the crew, a dining table, shower, toilet, and an 18-inch porthole for viewing the Earth and stars. One ton of food and 720 gallons of drinking water provided nourishment for three missions.

When it was launched in May 1973, Skylab was slated to perform many missions. Its sophisticated telescopes, cameras, and sensors would study the Sun, stars, and the Earth below. From the Earth data alone, scientists hoped to find ways to monitor and later develop the planet's vast resources.

Most importantly, Skylab would test man's ability to live and work for extended periods in a zero-gravity environment. With this last goal in mind, NASA chose a Navy physician, CDR (now CAPT) Joseph P. Kerwin to be a member of the first crew. As scientist-astronaut, he would monitor the crew's health and conduct a series of medical experiments to determine:



Dr. Kerwin

- *the effects of weightlessness on man's ability to perform mechanical tasks,*
- *assess the effects of long exposure to zero gravity on the cardiovascular system,*
- *determine whether normal sleep rhythms such as sleep and wakefulness are influenced by zero gravity and a rapid day-night cycle, and*
- *study nutritional requirements.*

The mission plan was to launch the Skylab into a 270-mile-high orbit and get it functioning smoothly. A day later, the astronaut crew of Charles "Pete" Conrad, Joseph Kerwin, and Paul Weitz would be launched, and after rendezvous and docking would enter the space station to begin their 28-day mission.

Disaster threatened from the beginning. During launch and orbital insertion, the Skylab suffered serious damage. A shield designed to protect the crew from meteoroids and the Sun's heat tore loose. Equally threatening was the loss of one of two solar panel arrays. The remaining panel had refused to fully deploy, providing the space station with but a fraction of its energy requirements.

NASA delayed the astronaut launch for 10 days as scientists and engineers at NASA facilities in Houston, Huntsville, Ala., and the Kennedy Space Center worked feverishly and around the clock to save the stricken Skylab.

When Conrad, Kerwin, and Weitz finally blasted off on 25 May 1973, they carried with them the simplest yet the best tools American imagination and ingenuity could devise.

After deploying an umbrella-like sunshade and freeing the stuck solar array with a hair-raising extravehicular space walk, the elated astronauts had the Skylab mission back on track.

U.S. NAVY MEDICINE recently visited Dr. Kerwin at his home base—the Johnson Space Center in Houston—where he is presently in-

volved in the Space Shuttle program.

Before being selected as a scientist-astronaut in 1965, the now 47-year-old Oak Park, Ill., native was flight surgeon with a Marine air group and a naval aviator. He earned a reputation among his NASA colleagues as the most widely read of the astronauts. During his 28-day stay in Skylab, he relaxed in his off hours by listening to classical music and reading books on his favorite subject—science fiction.

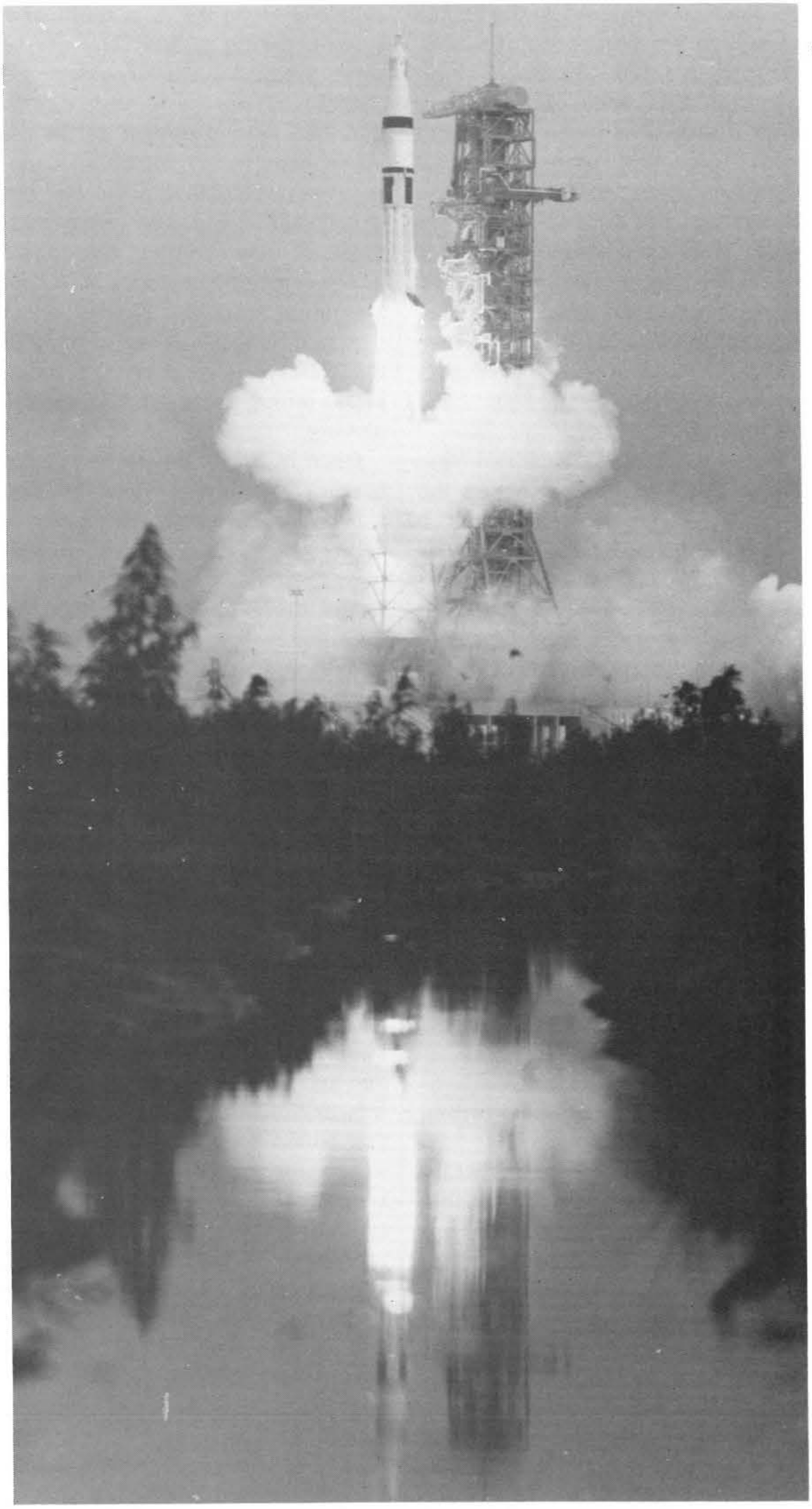
This is the first of a three-part interview with Dr. Kerwin.

USNM: Were you, in fact, the first physician in space?

Dr. Kerwin: No. I was the first American physician in space. The Russians launched a physician way back in the mid 1960s. His name was Boris Yegaroff. He was up for a whole 24 hours but something went wrong with the spacecraft. It sounded like a flight that was supposed to last considerably longer than one day but they brought it back after one day. Boris never flew again. One of my colleagues met him several years later over in Russia and described him as a Soviet version of a hippie. He was the sport-shirted, free spirit—probably a little bit on the outs with the establishment already. I think they have flown a physician subsequently, although not in a medical capacity.

You must have some strong feelings about being the first.

It's a lot of fun to do something first. But I must say that space flight is so impressive an experience, that it's worth doing whether you are the first or not. Being on the first Skylab flight was a good feeling, even though the flights were equally challenging—in fact, all the Skylab flights were almost carbon copies of each other. It was fun to be



NASA photo

Skylab crew blasts off from the Kennedy Space Center for a rendezvous with the orbiting space station, 25 May 1973.

on that first flight. When the Skylab was damaged on the way to orbit, we had to throw the whole flight plan into the wastebasket and in 10 days design a new one and go out and "save the program." That might sound unpleasant, but in fact, it was just the opposite. We were faced with a challenge. We had a bunch of rather crude tools to go up there and do a job with. If we succeeded, it was a big deal and if we didn't, at least we tried hard anyway.

When they initially found that things were not going well with the spacecraft, you didn't have much time to prepare.

Very little. In my 15 years at NASA, there are two episodes that stand out as evidence of a bureaucratic organization functioning superbly. One was Apollo 13 which was the mission on which the oxygen tank blew up and the command module lost all power. The crew had to crawl into the lunar module and somehow get back home. The other was this Skylab rescue mission. I'm not talking about the inflight portion of it. I'm talking about the 10-day period that began with the first sign on telemetry during launch that something was wrong with Skylab.

What actually had gone wrong with the vehicle?

Around the workshop was wrapped a sheet of aluminum that covered the whole circumference with spring-loaded levers underneath. The idea was that once you achieved orbit, you would release these springs and they would pop the whole thing out. It would act as a thermos bottle, reflecting the Sun's heat. When the shield got hot, the interior would remain cool.

As the vehicle went supersonic one minute after launch, a bit of air got under the leading edge and ripped it clean off in a tenth of a second, taking with it one of the solar panels at the shoulder and dumping it into the Atlantic Ocean. It ripped around until it got to the other panel and, fortunately, instead of taking that panel off, the shield just ripped and left a fragment of itself under this panel which remained in place. Scraps of aluminum from the ripped shield wrapped themselves over the top of the solar panel and riveted themselves into it, preventing it from deploying.

Once in orbit, the temperatures began to climb and when the controllers commanded the panels to deploy, they got no response at all from the right panel which was no longer there. From the left panel, they got a signal that it was unlocked. It opened about a foot and they got just a trickle of voltage from the solar panels, just a small portion of which were exposed.

In short, we had a vehicle that was extremely warm with just a trickle of electrical power. We had a third set of panels that did deploy normally.

For 10 days the controllers played a game with Skylab, turning its nose to the Sun in order to cool the surface. But when it was nose to the Sun, the solar panels didn't see the Sun and we lost all power. The goal was to find a compromise attitude that would keep it cool enough yet would still give it enought power to keep it alive so it could be controlled.

Meanwhile, on the ground, they began to think of ways to free the solar panel but, even more importantly, something to put over the top of the workshop to reflect the Sun. We came up with a parasol and a sail. We had three different concepts. All three were invented, designed, built, tested, packaged, and shipped to the Cape in 10 days.

On launch morning, we walked up the gantry into the command module and there was this big, brown blanket right under the seats with all these lumps and bumps inside of it—all this equipment, half of which we had never even seen in our lives and a little checklist that said what to do with it.

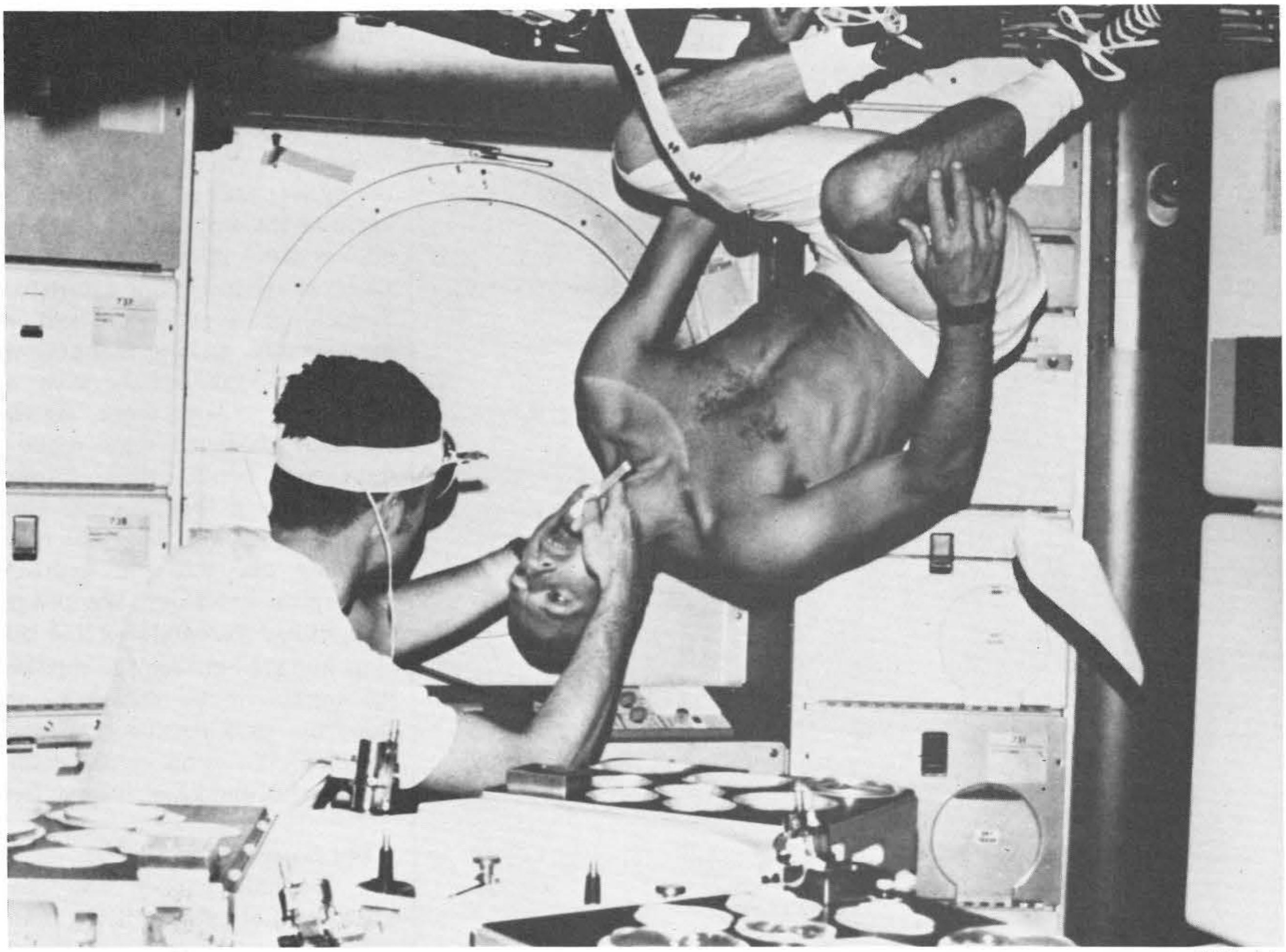
Did you ever get a chance to test any of it?

Some of the equipment we got to evaluate in the development stage. One of the first things we did was to fly back to Houston from the Cape. We split up the crew. One guy took this concept, one guy took that concept, and we worked the crew interface. How are we going to use this thing?

I got to go to Marshall Space Flight Center, broke my quarantine, and went in the water tank in the space suit and started evaluating means of going EVA (extravehicular acitivity) and deploying a sail. I worked with that for two or three days and then one of the backup crew boys took over and we went back to the Cape and regrouped as a crew.

Did you actually get to work with the parasol concept?

I wasn't working with the parasol. I worked with what they called the Marshall Sail. Of the three concepts, we used two. The second day in orbit, we deployed the parasol which was an umbrella-like thing we pushed through an airlock in the wall of the workshop. We didn't have to go EVA to deploy that. It was four fishing poles on a rod collapsed together like an umbrella with the material all folded in around it. You just pushed it out. As soon as the poles were free of the workshop walls, they were spring-loaded to come out flat, like an umbrella. We raised it and lowered it and jiggled it to make the folds and wrinkles come out and rotated it



An oral physical examination in space is a unique experience.

NASA photo

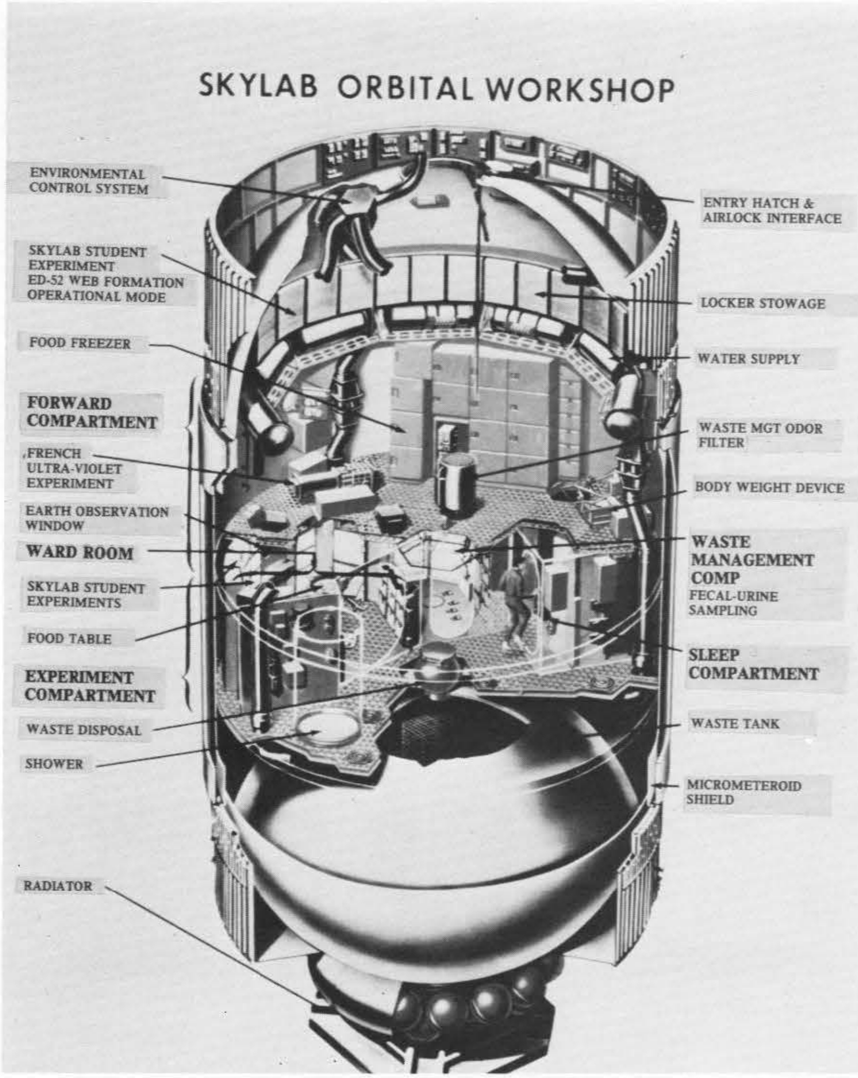
until it covered as much of the workshop as it could be made to cover. That worked satisfactorily and we brought the temperatures down from 130° inside to about 85°. From there, they varied as a function of Sun time.

When the second crew went up they took the Marshall Sail which was a sturdier, larger device that had to be taken out by two suited crewmen and deployed. We could have done that on the first flight. In fact, we kept asking for it because it was so much fun to go EVA. But they decided we had done enough. The second crew would do that.

When you went out on your first EVA, it was to get rid of the aluminum scrap jamming the solar panel.

The first thing we did was deploy the parasol. Then we worked in the Skylab as long as we could. We then had about 12 days to do as much of the flight plan as we could, eating the food cold, turning lights out whenever we exited a compartment—saving power. We could do the medical experiments because they were low power users. We could do some of the solar physics work, as long as we didn't power up too many experiments at a time. We couldn't do the Earth resources photography at all. We tried it once and red lights went on and all the batteries lost their charge. It was a disaster. We did the best we could for about two weeks.

Meanwhile, the guys on the ground, using our reports, began evaluating the situation. We had first-hand damage surveys. The first thing we did when we got to Skylab was to fly around it in the command module and take a lot of TV. We also described exactly what the situation was. Knowing what tools we had on board in part of this sea of brown rope that we had in the command module, was a batch of tools that we had randomly selected from a large table about five days before launch. They had gotten together every tool they could think of, mostly from the local Bell Telephone Company. We had a cable cutter that's remotely actuated by pulling on ropes. We had five or six



NASA photo

five-foot sections of aluminum pole. We had shepherd's crooks and saws—whatever we might need to go out there and do the job.

The backup crew on the ground went into the water tank, mocked up what the problem was, selected tools, and designed an EVA for us. We rehearsed that on the 13th day inside. We cut the ropes, put the poles together, and practiced what we would do. On the 14th day we went out and did it. I figured when we went out that we had a 50-50 chance. The problem was that the damage was down in an area of the workshop where there were no handholds, no footholds, no rails, no way to get there, and no way to stabilize our bodies while we were working. But we got around that by hanging on to each other's legs—we had a lot of fun up there.

Your heartbeat went up to 150 at one point.

It was the frustration of holding those 25-foot poles with the cable cutter on the end, with no stabilization and trying to get those jaws hooked onto the scrap of aluminum. Once we got it hooked, we could use the pole as a handrail and get down there and do our business. We finally figured out how to stabilize ourselves. There was a little eyelet at the base of one of the antennas just about in the right place. We took a rope of the right length, hooked it to my suit, down through the eyelet, back up, and hooked it again on the suit. Then all I had to do was stand up against it. It was short enough to give me a third foot. Suddenly, I was stable and not floating anymore, as long as I kept my legs taut. Klunk, out she went; we tightened the jaws down, crawled out there, fastened some ropes to the solar panel, then finished cutting through the last scrap. Once that was loose, the thing was ready to come up. But the hydraulic mechanism was frozen. We took the rope we had fastened to it and both of us just got between the rope and the surface of the workshop, and stood up, thus putting tension on the rope. We stood up and pulled and pushed, and bang, it came free.

Did it pop out suddenly?

It suddenly popped and came loose. Both of us went flying in different directions—on our tethers of course. By the time we both got stabilized and turned around, there she was, fully up, and the panels were slowly beginning to come out. It took them about four hours to come out all the way. By that afternoon, we were wallowing in electrons.

When you got on board, what did you find?

Before we got there, the ground remotely commanded the opening of a dump valve and dumped all the air out of Skylab. They then closed the valve and backfilled it again with oxygen and nitrogen one time. That's all the oxygen we could spare. They still weren't sure that it was safe. We carried up samplers, space versions of the old mining sniff tube—just a glass tube with a

chemical indicator. You pull air through it with a pump and watch for a color change. We tested the air in the workshop before we opened the door. We did it through a little vent valve on the hatch. The test turned out negative so in we went. The air had a smell to it—a burn smell from the excessive heat which I'll never forget.

How hot was it?

About 130° that first day, about like the engine room on a ship. You'd go down into the workshop, work for 15 or 20 minutes, and then come back to the north end of the vehicle near where the command module was docked. Actually, it was quite cool down there.

What other things did you find wrong when you got aboard? You obviously had the heat problem and there was some fear that the film may have been damaged or ruined.

The heat hadn't damaged the film. Later in the mission, the radiation began to fog the film, even though it was stored in a heavy aluminum and lead film box, one of the heaviest things in the Skylab.

Some of the food had been ruined by the heat. Amazingly, the frozen food hadn't. There was enough power to keep the freezer going. Some of the food such as the catsup which was stored in those little plastic pouches they have in restaurants, was all smelly and runny. At 130° it just went bad.

Some of the batteries and battery chargers had failed. That was about it.

There was some concern that some of the vitamin content of the food had been destroyed by the heat. We took some food samples back with us but I don't think the assays were good enough to determine the vitamin content. I suspect that we were a little short on vitamins and that was one of the reasons why we had some blood loss and some skin changes—very mild—but things that the other crews didn't have. In fact, they sent them up with big bottles of vitamins and they popped them every day just to make sure.

Back in the 60s, there were some ideas about what effect prolonged weightlessness would have as far as loss in bone density, red cell loss, etc. The cosmonauts were known to have experienced some ill effects. Did your mission or any of those subsequent to it demonstrate any of this?

Oh yes. I think we have a very accurate description of the syndrome now. We aren't so sure about the treatment but we can describe very accurately what happens to an adult, male, human being who spends one three-hundredth of a lifetime in weightlessness. Some of the changes are profound, considering the maturity of the organism. There is an immediate shift of blood and interstitial fluid from the lower to the upper half of the body, a growth of an inch to an inch and a half in size, just due to the unloading of the vertebrae. There is a dumping of fluid. When this fluid shifts, fluid that's normally trapped in the legs by gravity enters the circulation, increases the central venous pressure, dilutes the blood, and is excess baggage in weightlessness. You diurese or perspire it out and within 48 to 72 hours the body has lost three or four pounds of weight—totally fluid. The venous and pressure dynamics of the body have now returned to something approaching normal. But the blood is now concentrated. The hemoglobin is a few grams higher than normal. The bone marrow, now being hemoconcentrated, quits making red cells. We don't know what the signal pathway is. The body then becomes anemic. Red cells are not being destroyed abnormally but normal destruction is reducing the red cell count until, after three, four, or five weeks, the concentration in weightlessness is normal again. Red cell production then begins at a lower rate and maintains "normal" concentration.

When you return to earth after four weeks, you have lost plasma volume, interstitial volume, and red blood cells. You come back to gravity and immediately all this fluid is again trapped in the legs and the body is now in mild shock. You're low a few pints of blood. This accounts for the orthostatic intolerance, and explains why men returning from space traditionally have been a little unsteady on their feet. They are also unable to exercise very well, have a tendency to have an increased heart rate, and a lower blood pressure in the upright position; they can't tolerate standing very well initially.

But all this is physiological. It's adaptive rather than pathological. Within 48 hours on the ground, the fluid volume is back to normal; thirst takes care of that. The red cell production is much slower to come back to normal and the body is slightly anemic for the first four or five weeks, but not noticeably.

The interesting thing about all these cardiovascular changes is that they are rapid, relatively profound, and very noticeable. But they are time limited. They go so far and no further. They are not a concern for long duration space flight. The same thing is true with changes in the vestibular system, and the balance mechanisms. You get profound subjective changes in the way that apparatus works. It has to adapt to a whole new environment. It causes motion sickness on some of the crew early in the flight. But that's all over and done with in a week or 10 days. (To be continued in the January issue)

The Navy in Antarctica

Operation Deepfreeze

CAPT Noel S. Howard, MC, USN

The close of last month marked the 50th anniversary of Admiral Richard E. Byrd's historic first flight over the South Pole in November 1929. This occasion gives us pause for reflection regarding the continuing involvement of the Navy in general and the Navy Medical Department in particular in "Operation Deepfreeze."

Historically, the Antarctic Continent has been held in an ambivalent awe since antiquity when its existence was a matter of speculation. Indeed, Admiral Byrd warned, "Any man who elects to inhabit such a spot must reconcile himself to enduring the bitterest temperatures in nature, a long night as black as that on the dark side of the moon, and an isolation which no power on earth can lift for at least 6 months (the Antarctic winter from February to September or later." (*1*)

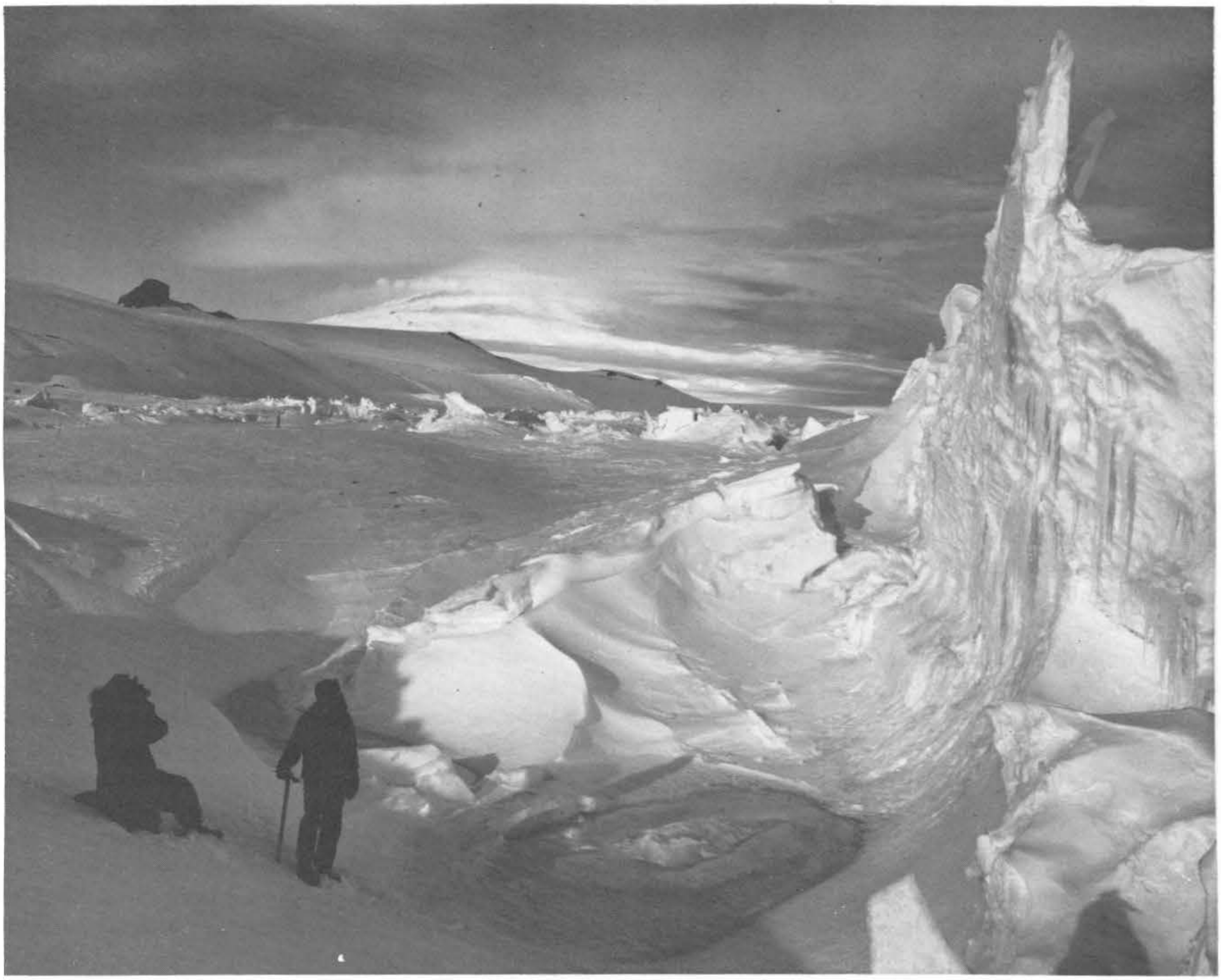
The International Geophysical Year (1957-1958) ushered in a new era of intensified, international, peaceful, cooperative, scientific exploration of the Antarctic Continent. The Antarctic Treaty (1969) is a reflection of this thrust. Technological developments have materially reduced the risk of physical exposure in that extreme environment, thereby allowing productive research in such areas as meteorology, geophysics (gravity, cosmic rays, etc.), geology, biology, medicine, and engineering.

Currently, the United States maintains four stations in Antarctica on a year-round basis: McMurdo—the largest, Palmer, Siple, and South Pole. Taken as a group, these stations annually provide winter-over accommodations for approximately 42 civilians, including about 23 scientists and in excess of 60 (involved in communications, transport, electronics, medical support, and other support functions) Navy personnel—with a potential to support many times that number. On occasion, additional American exchange scientists may winter-over at a "foreign" station (e.g. Russian [Vostok] and Polish stations) and vice versa. Overall program responsibility falls to the National Science Foundation (NSF) with logistic support provided by the Navy (Naval Support Force Antarctica (NSFA)).

Since the mid-1960s, the Navy has studied psychologic/behavioral adaptation within the aforementioned relatively small, isolated groups. In the wake of pioneering work in this area, (*2-7*) BUMED with the cooperation of NSFA and NSF has conducted psychiatric debriefings of winter-over personnel on site at the South Pole (and other stations on occasion) at the conclusion of winter-over (between mid-October and mid-November) on nearly an annual basis for the past decade. Such has indicated that, while the overwhelming majority of people surveyed have adapted quite well psychologically during their winter-over experience, and would be judged "successful," stresses associated with isolated small group

Entrance to Pole Station during the height of International Geophysical Year (IGY) activity.

Dr. Howard is head, Mental Health Programs Branch, BUMED (MED 3121) and is in charge of Psychiatric Screening for Operation Deepfreeze.



Photographing ice formations near McMurdo Sound.

living can produce explosive consequences particularly in the presence of overt psychiatric illness, alcoholism, or character traits such as paranoia, rigidity, intolerance of differences, and high excitability. Moreover, a variety of "nondisabling" psychiatric symptoms tend to occur with some frequency including disturbed sleep, depression, irritability, and impaired cognition. This collective experience has been incorporated into our screening process. Each candidate for winter-over in Antarctica (whether military or civilian) undergoes a rigorous medical screening process conducted by the Navy Medical Department including physical and laboratory examinations, health record/history review, and a thorough psychiatric assessment. The latter consists primarily of questionnaire completion and two interviews—one with a psychiatrist, the other with a psychologist. Further details concerning the psychiatric evaluation will be the subject of a subsequent article.

In summary then, the barren, frozen frontier which Admiral Byrd's historic flight helped to **breach has born fruit in terms of scientific research and international cooperation in which Navy logistic support and Navy medicine continue to play an integral role.**

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Professionalism in Health Care Administration

ACHA Admits MSC Members

LT Gary J. Spinks, MSC, USN

Most individuals participating in health care administration would probably not hesitate in labeling this career a profession rather than an occupation. Indeed, this perspective of health care administration seems to be intuitively correct. However, to legitimately classify health care administration as a profession, it must be determined that the accepted characteristics of a profession are present.

The concept of a profession is well documented in the literature and a number of specific, identifiable traits are available for comparison. It is generally agreed that a profession requires expertise based on an extensive body of knowledge. This knowledge is highly technical and requires a long period of training to be mastered. *(1)* Examples of this type of knowledge in health care would be the Accreditation Standards of the Joint Commission Accreditation of Hospitals (JCAH), various public laws, and within the Navy, the Manual of the Medical Department, and various directives. Clearly, this characteristic is present within contemporary health care administration.

The second characteristic is that professions have a "service orientation." This means that the objective of a profession is to provide the public with a service rather than products or goods. *(2)* Health care does not involve any one, concrete article but rather a variety of processes and procedures that result in a state of health rather than a state of illness.

The nature of a profession causes the individual members functioning within it to identify more strongly with their profession than those practicing nonprofessions identify with their occupations. *(3)* This leads to the last characteristic of a profession which is that the practitioners tend to join together to form collegial, professional organizations which set standards of behavior for that profession. *(4)*

It is apparent that health care administration meets the above criteria of a profession. However, it is implied that practitioners in health care administration have to do more than simply work in the field to be considered true professionals. Initially, all MSC officers in the Health Care Administration section demonstrated their professional capabilities.

Some possessed extensive knowledge and experience gleaned from years of naval service while others were commissioned after a considerable educational endeavor which culminated in an advanced degree in Health Care Administration or a related field of concentration. Both groups had attained and demonstrated the first characteristic of a professional. But, how do health care administrators acquire and retain these traits? Highly technical knowledge in this field continues to change and grow, demanding an ongoing educational process. These requirements can be provided by one of the above characteristics of professions and professionals, namely, that of professional affiliation. In this particular case, it would be the American College of Hospital Administrators.

Unfortunately, not all the Navy's Health Care Administrators possess the requisite education and experience to insure their acceptance into the American College of Hospital Administrators, a society long recognized as the most prestigious by most health care organizations. To those who have achieved this pinnacle, congratulations are in order. To those who aspire to College membership, hard work and sacrifice are in order.

The American College of Hospital Administrators is—and has been for the past 40 years—the professional society for those who administer health services facilities and programs. Administrators have banded together in the College to professionalize the skills and techniques of health service organization and administration to assure quality patient care. The College provides its affiliated with the hallmark of professionalism through certification, continuing education, publications, referral services, interaction, guidance, sponsorship, and representation. *(5)* By its certification process, the College insures that its members are professionals in every sense of the word. Medical Service Corps officers who are graduates of acceptable graduate programs in hospital or health services administration may apply for membership in the College if the applicant:

- is engaged in a responsible administrative position in an acceptable hospital, group of acceptable hospitals, or a related health activity influencing the operations, growth, and development of hospitals or other acceptable health care services and programs;

From the Department of the Navy, Bureau of Medicine and Surgery (MED 422), Washington, D.C. 20372.

• meets the eligibility requirements prescribed by the College in other respects.

MSC officers who have not earned the master's degree in hospital or health services administration from an acceptable program but do possess a related masters degree may apply for membership in the College if the applicant:

• is engaged in a responsible administrative position in an approved hospital; group of approved hospitals; an acceptable health services organization or program influencing the operations, growth, and development of institutions, services, or programs of the health delivery system; or is affiliated with other acceptable health services and programs;

• has had at least one year of successful experience in such a position;

• declares his or her intention to continue in the field of health service administration;

• in all other respects meets the requirements prescribed by the College.

MSC officers who possess an acceptable baccalaureate degree may qualify if they meet the above requirements for a related masters degree, but these applicants must have at least three years of successful experience in such positions. *(6)*

MSC officers who desire to identify with their profession, follow certain standards of behavior, and continue to pursue education in this field, should seek membership in this professional organization for their personal benefit.

Acceptance by the American College of Hospital Administrators is an unwritten requirement for the health care administration profession. While membership is voluntary, to be accepted for membership is to attain recognition for perseverance and dedication to the ideals of this dynamic profession.

In fiscal year 1979 the following MSC officers were admitted to nomineeship:

CDR William L. Blankenship, MSC, USN
CDR Norman K. Owens, MSC, USN
LCDR Douglas N. Benander, MSC, USN
LCDR Milton J. Benson, MSC, USN
LCDR Philip E. Dould, MSC, USN
LCDR Leland R. Maassen, MSC, USN
LCDR John H. Storment, MSC, USN
LT Jerry T. Anderson, MSC, USN
LT J. Thomas Benson, MSC, USN
LT Ronald W. Black, MSC, USN
LT Douglas S. Delong, MSC, USN
LT Dennis C. Dunkleman, MSC, USN
LT Peter P. Garms, MSC, USN
LT Michel E. Hanson, MSC, USNR
LT Stephen W. Kaja, MSC, USNR
LT James T. Kirch, MSC, USNR
LT John R. Leysath, Jr., MSC, USNR
LT Robert S. Peiser, Jr., MSC, USNR
LT William R. Sattley, MSC, USN
LT Amance R. Simas, MSC, USN
LT Terry J. Tingley, MSC, USN
LT Michael L. Todd. MSC, USN
LT Joseph P. Van Landingham, MSC, USN
LT Gale F. Wallace, MSC, USN
LT John C. Wocher, MSC, USN
LTJG John F. Clark, MSC, USNR
LTJG Raymond L. Ford, MSC, USNR
LTJG William P. Frank, MSC, USNR
LTJG Jeffrey P. Harrison, MSC, USNR
LTJG A. Ben Long III, MSC, USNR
LTJG Larry T. Mercer, MSC, USNR
LTJG Donald H. Rosenbaum, Jr., MSC, USNR
LTJG John D. Rudnick, Jr., MSC, USNR
LTJG James R. Vroom, MSC, USNR

In order to be eligible for member status, an officer must be a nominee in good standing for at least three years and show evidence of continuing professional education and growth. To advance in status, affiliates must then qualify by passing stringent written and oral examinations. During fiscal year 1979, the following MSC officers were successfully advanced to member status:

CAPT Francis G. Anderson, Jr., MSC, USN
LCDR William J. Lambert, MSC, USN
LCDR Leonard L. Moore, MSC, USN
LT Kenneth D. Gibson, MSC, USN
LT Dean A. Hermann, MSC, USN
LT Patrick L. Mahin, MSC, USN
LT Gary J. Spinks, MSC, USN

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* * *

The efficacy of linkage systems in health care services, cost containment and productivity, management information systems and standardized accounting procedures, public accountability and program evaluation are among the many complex issues facing all health care professionals in our society today. In providing health care within the naval service, we face a professional challenge and a unique opportunity for national leadership in each of these and other related problem areas.

To meet that challenge, experience is vital. But it is not sufficient alone. Continuing education is also essential, as in our active participation in the many professional societies of our respective clinical, scientific, and administrative fields. In that regard, I am especially proud of the rapidly growing number of Navy Medical Service Corps officers who are continuing their education and advancing in their affiliation with professionals of learned societies.

In that spirit, I express particular congratulations to those health care administration officers cited in the article by LT Spinks, whose advancement through credentials of the American College of Hospital Administrators reflects their professional growth, to the benefit of the naval service.

CAPT Paul D. Nelson, MSC, USN
Chief, Medical Service Corps

MSC: Not Always Medical Service Corps—Sometimes It's Military Sealift Command

CAPT Bernard R. Blais, MC, USN
CDR Edward J. Sullivan, MC, USN
CDR Mark O. Abbott, MC, USN

If you were a gambler and someone offered to bet that there are nurses and civil service employees in the MSC, you might jump at it. If you did, you would be a loser, although you'd be wiser.

You are correct in believing that there are no nurses in the Medical Service Corps, since the Nurse Corps is a separate corps of the Navy Medical Department. You are also correct in believing that the MSC has only commissioned Navy staff officers, and has no civilians. But you would have lost your bet because you assumed that MSC meant the Medical Service Corps.

Most members of the Navy Medical Department automatically equate the letters "MSC" with the Medical Service Corps. But there is another MSC, and its relationship with the Medical Department is tenuous at best. It has nurses, civil service nurses at that, and they serve aboard Navy ships. This MSC is the Military Sealift Command.

For some, the letters MSTS may conjure up memories. They stood for the Military Sea Transport Service, which carried troops and supplies and later transported dependents. Established in 1949, it was renamed the Military Sealift Command, just as the old Military Air Transport Service (MATS) is now know as the Military Airlift Command (MAC).

While it may be far removed from the Medical Service Corps in most aspects, the MSC is very much a part of the Navy, even though most active duty personnel are not familiar with the command or its operations.

Active duty Navy enlisted personnel are assigned to the Military Sealift Command as are line and staff corps Navy officers. There is even one Marine Corps officer. But what seems strange to many active duty Navy people who join the MSC is the large number of civil service employees. There are 4,000 civilian sailors in the Navy, all MSC employees. Some civilian Marine personnel even operate the command ships.

To avoid any misunderstanding, the Military Sealift Command is a full-fledged component of the operating forces of the U.S. Navy and its commander reports directly to the Chief of Naval Operations in operational matters. On procurement and contracting matters, he is responsible to the Assistant Secretary for Navy Manpower, Reserve Affairs and Logistics. Overall, the Secretary of the Navy is DOD's single manager for Sealift. The MSC provides vital logistic support not only to the Navy and Marine Corps, but to all elements of the Department of Defense. It also supports some other Federal agencies as well, such as the National Aeronautics and Space Administration and the Agency for International Development.

MSC's Mission

MSC's ultimate mission is to provide sealift for all elements of the Department of Defense in contingency situations. It prepares for that mission by delivering military cargo worldwide in peacetime.

Although the MSC's functions are many and varied, they may be categoried in three general areas: delivery of surface cargo, operation of Navy Fleet Auxiliary Force ships, and operation of Scientific Support ships.

The MSC's cargo operations involve point-to-point transport of fuel, equipment, ammunition, foodstuffs, and all items needed by defense units scattered around the globe. The MSC, no doubt, had a hand in the transportation of your auto and household goods when you went overseas. In essence, the MSC is the Navy operating agency for sealift.

Navy Fleet Auxiliary Force ships, 22 in number, are MSC-crewed and operated but directly support the combattant fleet. They supply fuel for the ships, equipment and supplies, including fresh food for the people aboard.

Dr. Blais is Surface/Sealift Medicine Liaison at BUMED (MED 3C3) and a staff medical officer at the office of the Commander, Military Sealift Command (Code M-4M).

Dr. Sullivan is with the Occupational Medicine Division at BUMED (MED 5521).

Dr. Abbott is Brigade Surgeon, 1st Marine Amphibious Brigade.

Oilers and stores ships are regularly involved in underway replenishment (UNREP) operations. Fuel is generally transferred by hose lines, but dry cargo may be transferred by high line or helicopter using vertical replenishment or VERTREP. MSC-operated point-to-point tankers also participate in replenishment operations with the Navy fleet.

Scientific Support operations tend to be more exotic. They range from tracking NASA's rockets to support of oceanographers who map and probe the seas from MSC ships. Scientific Support ships are designed and equipped to fulfill a variety of special tasks.

MSC's Personnel

Personnel involved in operation or support of Military Sealift Command ships are:

Active Duty Military—generally command staffs or assigned to shipboard military detachments aboard Scientific Support or Fleet Auxiliary Force ships.

Ships Company—U.S. civil service marine personnel who operate all nucleus fleet ships, except for 18 tankers operated by contractors.

Ships Company (Chartered Ships)—civilian seafarers, but not civil service employees of the Navy. They are employees of commercial shipping firms operating MSC charters, or firms that contract with the MSC to manage and operate tankers or roll-on, roll-off ships.

Technical Crew—May be contractor employees, civil service workers, or active duty military personnel. They may be members of an organization supported by MSC ships, such as NASA, or they may be employees of a company under contract to the "sponsor." The sponsoring organization is, in effect, the company that pays the cost of these MSC ship operations.

He knows the ropes, cables, and a lot more. Civil service mariner Jerry Kroutchic gets things shipshape aboard USNS Passumpsic for the next UNREP operation.

Active Duty Military Personnel, whether members of Military Sealift Command or members of a sponsor organization, are managed and treated like all active duty military personnel.

Ships Company Personnel, employees of Military Sealift Command, are part of the excepted service and are seagoing specialists. These ship crewmembers are unique in that they are eligible as U.S. seafarers for certain medical services provided by the U.S. Public Health Service. Those services are roughly analogous to medical services provided by the Navy to active duty personnel. As civil service employees of the Navy, serving in Navy ships worldwide, they are the responsibility of the Navy for medical services generally provided to civil service employees and for special services related to their special occupation. These services are addressed in detail in BUMEDINST 6320.52. Medical support of Military Sealift Command personnel and others associated with the Military Sealift Command are addressed in the following directives:

USNS Passumpsic refuels the USS Tripoli (LPH 10) underway. This is one kind of UNREP operation.

Medical Care for Eligible Persons at Naval Medical Facilities, BUMEDINST 6320.31, Medical Support of Military Sealift Command, BUMEDINST 6320.52, Medical Manual of Military Sealift Command, COMSCINST 6000.1 (This is now an enclosure of BUMEDINST 6320.52.

When MSC civil service mariners present themselves at a Navy medical activity, each should have an Individual Sick Slip (Form DD 689), identifying the employee, the vessel, the command, and the chargeable account which constitutes authorization from the vessel's master. Each should have a supplemental medical record, providing at least a summary of past medical history and treatment, and space for recording current examination results and treatment. Details of physical requirements may be found on an included copy of the Certificate of Medical Examination (SF 78).

Contract Ships Company Personnel are civilians, but not Navy employees. Outside the United States and its territories they should be provided humanitarian treatment and referred to the area husbanding agent for the shipping company that employs them. The nearest Military Sealift Command office or agent will assist in making contacts and arrangements.

In the 48 contiguous states, Hawaii, Alaska, Guam, Puerto Rico, and the Virgin Islands, humanitarian emergency treatment should be provided with subsequent referral to a U.S. Public Health Service medical facility. A phone call to the nearest Public Health Service facility will secure the proper authorization for reimbursement by the government for treatment rendered and will enable early transfer to a Public Health Service medical facility. Immediate notification is essential, as the Public Health Service will not reimburse the cost of treatment in event of after-the-fact notification and authorization.

Technical crew civilian personnel also should be given only emergency humanitarian treatment, which is reimbursable by their employer. The employer is responsible for these civilian employees both in the United States and overseas. Since they work aboard MSC ships,

the cognizant command office or agent will assist in contacting the employer representative and in arranging for whatever disposition is indicated.

The medical problems of civilian Marine personnel tend to differ from those of young active duty military personnel and their dependents. The average age of a civil service mariner is between 48 to 54 and medical problems of the middle aged tend to predominate. Although drug abuse is not unknown, it is relatively rare. Unfortunately, problems with alcohol are not.

Many civil service mariners sail on medical waivers for conditions that would render them unfit for military duty, especially for chronic degenerative diseases and aging problems such as hypertension, arteriosclerosis, chronic obstructive pulmonary disease, obesity, a variety of defects left by trauma, diminished visual acuity and (except in deck personnel) even complete loss of vision in one eye.

Before medical officers react in horror at such people being at sea, remember that Lord Nelson, the hero of Trafalgar, had only one eye and an empty sleeve. Not all peg-legged, patch-eyed, and Captain Hook type pirates were figments of imagination. Such people existed, and those who came out second best in encounters with them took small comfort from their altered physical states. The wooden ships may have passed into history, but there are still some iron men about.

Civil service employees are not obliged to retire at any specified age. At least one now sailing for the MSC is over 70 and is considered an especially competent seaman.

Yet there are times when even the highly motivated person is physically unable to function safely and effectively. At such times, the cognizant medical officer should find the mariner unfit for duty. With rare exceptions, either light or limited duty is a practical impossibility for a crewmember on an MSC ship. This is especially true in the case of ships engaging in underway replenishment operations, where all crewmembers lend a hand and regularly perform tasks not included in their regular work.

Since few medical officers have had direct experience with MSC ships, those who must make the decision of fit or unfit for duty can benefit greatly by discussion with ship officers and by referring to the supplemental health record where physical requirements are listed (SF 78). If it seems unlikely that the civil service mariner would be fit for duty in time to sail with the ship, the master should be informed as soon as possible, since the ship is not able to leave port until a replacement is obtained.

At the time of hiring or rehiring, waivers may be granted by the MSC when an applicant does not meet physical standards. If the applicant has a badly needed skill and the personnel department is willing to accept the additional risk involved, a waiver may be granted. Waivers are not intended for use in the case of acute illness or injury, nor are they to be issued by the medical department.

Where a Navy medical facility does pre-employment examinations on candidates for MSC employment, there is interplay between the facility and the MSC personnel office. In some cases, the examining physician may recommend a waiver, and the recommendation may have a condition attached. For example, a waiver of defective vision might be recommended provided corrective lenses are worn. In any case, the medical department only recommends. The personnel office decides whether to grant a waiver.

Medical officers examining and treating civil service mariners where U.S. Public Health Service facilities are available can usually refer the mariner for further evaluation or treatment without much difficulty. In those parts of the world where such facilities are unavailable, the responsible physician must make a preliminary diagnosis. A further diagnosis then determines fitness for duty before sailing time. If the mariner is found unfit, a decision must be made either to send him to a U.S. Public Health Service facility or have him medically evacuated. Again, the cognizant Military Sealift Command office or agent can be helpful in working out details, and may be able to provide information that can help determine whether the mariner can or should be repatriated by commercial transportation.

Details of dental care for civil service mariners are addressed in BUMEDINST 6320.52 and its enclosure, COMSCINST 6000.1. In general, the Navy provides civil service mariners only emergency dental care. Other dental care is provided by the U.S. Public Health Service or at the employee's own expense. Special arrangements may be made to cover a particular situation.

There's still much more to know about "the other MSC." What else might it be called upon to do? As in the past, the Military Sealift Command might operate transports to meet the needs of a contingency situation. Its ships might again have to transport thousands of evacuees from trouble spots around the globe. You might even find yourself working aboard an MSC ship one day as part of a team staffing an alternative to a dedicated hospital ship. In summary, the Military Sealift Command is an active part of the operating forces of the U.S. Navy, tasked with providing sealift support to the Department of Defense. What does that support include? Whatever is needed.

Emotional Disorders of Learning

CDR Eli Breger, MC, USNR

"There is nothing so much worth as a mind well instructed." Ecclesiasticus

There is universal agreement that for a child to deal effectively with his environment he must be educated. He needs to develop an ability to learn from experience and a capacity to deal with symbols of the written and spoken language. A child who learns well develops self-confidence and provides gratification and reassurance to his parents.

Many children do not learn well and there soon develops a significant gap in academic achievement between what is expected by his parents and teacher and what is attained by the child. Successful learning depends primarily on a child of adequate intellect with a normally developed and organized brain and central nervous system. A skillful teacher and interesting classroom environment enhance success.

Even with these elements present many children do not learn well because of their psychological problems. In this essay our focus will be on this area of emotional blocks to learning. Underachievement is invariably not an isolated finding. It is but one vital symptom clustered with other expressions of behavioral difficulty. It is essential to study the entire child to enable one to identify the specific learning problem and develop a proper therapeutic plan. Doing this early in his elementary school career is vital because personality then is still more fluid and capable of change.

Core of Problem

Emotional disorders of learning reflect personality problems due to disturbances in the child's relationship with key figures in his environment. The disturbance may be overtly noticeable or of a more subtle nature.

The educational process is hindered in essentially two ways. First, emotional energy is deflected away from learning. Second, the child perceives learning as threatening and thereby resists dealing with it. In most cases several emotional and developmental issues merge and overtax the child's adaptive capacity. This is often coupled with subtle neurologic and sociologic factors.

Dr. Breger is Chief of the Psychiatry Service at the Naval Hospital Beaufort, S.C. 29902.

In spite of the uniqueness of each child's situation it is useful for evaluative and treatment purposes to categorize. By so doing, several commonly seen clusters emerge. A child usually fits prominently into one such group, even if not perfectly and entirely. Let us look at some of the commonly seen groupings.

The Normal but Slowly Maturing Child. Development is essentially normal but proceeds at a slower rate reflecting constitutional factors. Motor landmarks (sitting, crawling, walking, etc.) develop on schedule and there is a relative freeness from emotional disturbance. The child seems to have been genuinely happy during early years but slow in the realm of social and emotional development. Test results for school readiness tend to be poor. Play orientation is prominent yet work is a demand of which he is not yet capable. Only time will ready him. Therefore, the child is helped by a transitional class which works at a slower rate or perhaps by repeating a grade.

The Unrelated Child. This youngster has never formed a deep love tie with his mother and so is unable to transfer this bond to the teacher. Without the bond no basis exists for a student-teacher relationship which would enable him to develop the incentive to learn. This child is characterized by emptiness, immaturity, anxiety in new situations, and preoccupations with pleasant and nurturent daydreams. His history reveals gaps in infant care resulting from significant problems in the stability and security of family life or in the mental health of his mother.

The Primitive Child. He is governed by his instincts and has difficulty controlling and diverting unacceptable drives into socially acceptable channels. The child appears to be totally pleasure oriented and seeks immediate gratification. Disorganization is noticed in almost everything he does. He functions as a much younger child and does not apply himself consistently to any work task. He responds to frustration with temper tantrums. Such youngsters come from homes characterized by permissiveness, disorganization, and low levels of expectation.

The Aggressive or Submissive Child. Both presentations are opposite sides of the same coin. Each reflects a child who has difficulty dealing with authority. The aggressive child appears to drain his energy by fighting when he thinks he is under attack. Because of this, his relationships are poor. He is unable to accept constructive criticism and tends to affiliate with other

aggressive children. There is a general distrust of people and their motives. Overactivity and distractability are clearly seen and further deflect emotional energy away from the learning task. The child's home environment is characterized by considerable family strife providing a model for his own behavior. The parents tend to be excessively authoritarian in their training and discipline. They demand blind obedience for the purpose of attaining dominance. They do not help their child to gradually develop a code of acceptable social behavior.

Although the submissive child appears to be very much the opposite, he is not. His emotional nature is weaker and he has been made afraid by the forces and pressures described above. He has constructed a strong inhibitory armor beneath which seethes much destructive rage. The energy required to control his emotions is not available to him for learning. He appears fearful, fragile, sensitive, and highly anxious. When pushed to the brink, his anger frequently does emerge. At other times it escapes in the form of secretive and unsociable behavior.

The Highly Anxious Child. His anxiety may be so visibly noticeable that he appears to be "creeping out of his skin" from tension. He is overly active and distractable. His anxieties reflect a variety of security threatening situations which may not be too hard to uncover should one investigate. This apprehension seriously interferes with ability to concentrate and therefore his facility to learn. Perhaps there is parental dissent, separation, illness, or death playing a role within the family.

The anxious youngster also exists whose creative potential cannot be harnessed. In his own mind, usually on an unconscious level, it seems dangerous to learn. Some of the underlying issues appear as follows. He is afraid to assume a position of competence because more and more will be asked of him. He is afraid to commit himself because of the threat of error and criticism inherent in early learning and the teaching process itself. Poor learning may reflect fear that his actual ability is not there or that the well will run dry should he let himself try too often. On occasion, one sees a child whose early learning was coupled with a traumatic event, leading him to conclude that knowing is dangerous; an example is a child who learned to spell dirty words for which he was severely reprimanded.

The Preoccupied Child. This child's life history includes loss of loved ones, defects in maternal nurturence, and a general feeling of never having fully experienced fun and pleasure. Unlike the unrelated child this youngster has established primary love ties and therefore is relatively stronger. His daydreams are invariably of a play oriented or wish fulfillment nature. They may reflect a child who was placed in a nursery school or day care center at a too early age and for long periods of time. This may have led him to think often of how nice it would be to be home with his family.

Other children may be preoccupied with feelings of guilt having to do with unacceptable thoughts of an aggressive or sexual nature. This latter issue is often present in a passing manner during junior high school and may account for the academic slump so commonly encountered at that time.

Advice to Parents

Corrective efforts should initially focus on the early identification of such children with diagnosis of the type of emotional block to learning with which we are dealing. The family can do a great deal through observation and self-analysis. Their efforts should then be enlarged to include a school conference and consultation with the family physician or pediatrician. Verification of the child's neurologic soundness and general good physical health is primary. Particular attention should be given to evaluating his vision and hearing adequacy. Skillful psychologic testing plays a vital role in assessing the child's intellectual ability and ruling out any specific, nonemotional learning disability.

Once we have clarification of the specific nature of the emotional block to learning, corrective efforts on many levels may be necessary. Most helpful is the correction of any imbalance within the family which has impaired the child's development of trust and security. When we help a child to "learn to love" we go a long way toward enabling him to "love to learn."

As to how much parental involvement in the supervision of his studies is required depends on the nature of the child and his parents and the working out of a plan with teachers. Generally speaking, the youngster should be held responsible for his work. Parents are often not the people who can carry this out effectively. Backup support of the child's teachers is necessary.

The classroom situation is important. A skillful and experienced educator can be of immense help, particularly after he or she knows more about the child's problem. The teacher's role is primarily and basically to teach. With personal and clinical information, the educator should be able to improve the quality of the relationship with the child, thereby increasing teaching effectiveness. For many disturbed children, placement becomes necessary in special classes or schools offering a more favorable teacher-pupil ratio and more specialized teaching techniques. Quite often, psychotherapy for the child with accompanying parental counselling is a vital part of the therapeutic plan.

Refresher Training for Submarine Hospital Corpsmen: A Working Model

CAPT B.D. Dutton, MC, USN

With the useful half-life of medical knowledge often estimated as short as five years, there is general agreement that health workers must pursue a vigorous program of continuing education (refresher training) or risk rapid functional obsolescence. Since the absolute amount and complexity of medical knowledge are increasing logarithmically, the program must be as efficient as possible to remain timely.

Recognizing this training need, the medical and commercial education communities have responded with a bewildering array of continuing education offerings—lectures, journals, seminars in exotic environments, films, videotapes, audiotape series, and on and on. Many of these offer high quality education, but most fall far short of being classified as an optimal continuing education program.

Though a full discussion of the subject is impossible here, there are a few highly desirable guidelines. An optimal continuing education program should be:

- systematic and pursued according to a specific plan.
- all inclusive and accessible to everyone who needs it.
- task-based to insure that it remains relevant and purposeful.
- comprehensive to cover all areas of need.
- diagnostic and prescriptive in that it should assist workers to determine their weaknesses and be capable of correcting them.
- individualized.
- capable of producing measurable results.

Dr. Dutton is director, Operational Medicine Department, HSETC Bethesda, Md. 20014.

Hospital corpsmen who serve aboard submarines face the same continuing education needs and obstacles as their nonundersea and civilian colleagues. There are, however, several constraints presented by the undersea environment. For example:

- Shore assignments for the HM(SS) are often administrative positions. Therefore, maintenance of clinical skills depends largely on the refresher program.
- Corpsmen must often report directly from shore assignment to their new units instead of via a refresher course. Once corpsmen are aboard, due to the high tempo of operations and inspection schedules, commanding officers are commonly unable to excuse them for training.
- There is no mandatory requirement for refresher training other than at the local level.
- Areas of submarine concentration do not always include an NRMC that could be used for training.
- The corpsman's communication with support medical personnel for consultation is not aways good.
- All future training must consider the physical and psychological environment of the submarine, including the AMALs (Authorized Medical Allowance Lists).
- All future on-board training must be consistent with the limited reference material, equipment, and instructional hardware available aboard a submarine.

Under direction of the Naval Health Sciences Education and Training Command (HSETC), a continuing education program has been developed which when supplemented by existing programs, both meets these guidelines for a high quality training system and recognizes the constraints of undersea operations. The logic, methodology, and many of the instructional materials of the system are readily adaptable for use in other medical settings. Development was in accordance with

standard instructional design procedures in NAVEDTRA 106-A.

Training Needs

Experts from the submarine community and education staff at HSETC identified training needs in the cognitive (pertaining to knowledge of facts and figures) and psychomotor (the ability to perform manual skills) domain. None in the affective (pertaining to attitudes and motivations) domain were thought necessary for inclusion in the program. There was unanimous agreement that the program should emphasize clinical skills; there are already suitable mechanisms for training in administration. Requirements fell into the following categories:

- History and physical; general data collection
- Problem-solving as applied to diagnosis and patient management
- Laboratory procedures
- Clinical features of specified conditions and diseases
- Manual skills

A complete outline of the refresher program content is available from HSETC.

Training Strategy

The goal is that all submarine hospital corpsmen going to or actually on operational assignment participate in the formal continuing education program, with recertification of competence in specified clinical skills every 18 to 24 months. All corpsmen holding NEC 8402, even if assigned ashore, are encouraged to participate.

The principle of the training system is that the corpsman meets defined training objectives by participation in one or more of a variety of formal and informal training experiences which are carefully oriented toward the objectives. Current certification may be evidenced by a qualification card listing the required clinical areas and practical skills, with competence validated by a medical officer or an appointed representative, such as a physician's assistant or a laboratory technician. Training will be conducted aboard the submarine and in an NRMC.

Training Methodology

For clinical experience to be meaningful, students must have an adequate academic base of knowledge and skills. Ideally they should have this base before participating in a clinical course. To this end a recommended program of independent study aboard the submarine is being prepared. The study materials are subject-based and cover the previously identified required areas. This includes textbooks, journal articles, films, and other types of educational material. Most important, following a detailed study guide and schedule will assure coverage of all subject areas within a one-year period. Also important is a list of criterion-referenced objectives* (all of which are covered by the materials) based on previously determined job requirements. All materials will be available from the squadron medical office.

This plan aims at maintaining corpsmen who can do their job well (criterion-referenced objectives); it also encourages those who desire and are capable of an enrichment program (subject-based materials and study guide).**

At NRMCs in areas of high submarine concentration, the goal is to establish a two-week, clinically oriented, formal training program. The course has specific clinical objectives and is highly experiential in nature, oriented around a series of clinical rotations, with just sufficient didactic opportunity to integrate the experiences. Teaching modalities include:

- Case study
- Teaching ward rounds (using selected patients)
- Observing and participating in patient care in such areas as the OPDs, ERs
- Supervised practice in specified clinical procedures
- Teaching conferences
- Clinical rotations and evening duty
- Clinical simulation, such as models, mannequins, simulated patients, and computerized instruction

If corpsmen complete the recommended program of independent study at their duty station, there will be little need for basic study at the NRMC. In this case, they may devote essentially full time to clinical matters; however, this may not be possible. Furthermore, not all the recommended clinical content can be covered in a two-week period, or the desired clinical material may not be available. Therefore, to define more exactly the academic base, upon reporting to the course, each trainee will take a diagnostic pretest covering the desired clinical content. This will point out items for emphasis and areas of competence that can safely be omitted.

*The criterion-referenced system is a no-frills approach to education in which specific skills are taught and limited objectives sought. A student, for example, must recognize a disease's specific symptoms or learn to use a medical instrument.

**The subject-based concept allows the student to go beyond the essentials and study the subject more intensively. This might mean the general study of, for example, physiology.

At the course site, six self-paced teaching modules for supervised self-study and specifically oriented toward independent duty submarine medical practice will be available for trainee use. They cover respectively: History and Physical Examination, Abdominal Conditions, Chest Conditions, Neurologic and Psychiatric Disorders, Genitourinary Conditions, and Dental Conditions. Their purpose is correction of academic deficiency, partial substitution for unavailable clinical material, or general review. Each module is in the format of the Personalized System of Instruction (PSI) advocated by Dr. Fred Keller of Georgetown University. Designated hospital personnel will serve as proctors for each module. PSI is ideally suited for this training. It has the specific advantages of conserving faculty time, yet is flexible enough to readily accommodate irregular and varying student schedules and abilities. During the two-week period, corpsmen will go through as many of these modules as indicated by their pretest, or as they desire, or have the time for.

Implementation

Instructional materials are now being developed, and on a limited basis, the clinical training has been instituted at NRMC/Naval School of Health Sciences, Portsmouth, Va. Initial reaction to the course has been strongly positive. A continuing education system such as this, which is based on proven principles of learning and offered in a manner well accepted by students, should go a long way toward maintaining the high level of competence expected of Medical Department personnel.

Professor Lambertsen Awarded Mark 5 Helmet

At the 1979 annual meeting of the Undersea Medical Society in Key Biscayne, Fla., 13 Navy diving medical officers presented a brightly burnished Navy diving helmet to Professor Christian J. Lambertsen, M.D. for the Institute for Environmental Medicine in Philadelphia. The Institute, founded by Lambertsen, is part of the University of Pennsylvania Medical Center. Its research and training programs utilize a very sophisticated high pressure chamber facility capable of simulating human dives to as deep as 2,000 feet of seawater. Since 1959, through an agreement between Lambertsen and the Navy's Bureau of Medicine and Surgery, Medical Department officers have received extensive postgraduate training in diving physiology at the university. The training program was established by the Navy to accelerate direct human working access to continental shelf and slope depths.

In a plaque attached to the helmet, the 13 former students, ranking from LCDR to CAPT, thanked Lambertsen for the quality of his training program and for his long-term influence on Navy diving. In accepting, Lambertsen called attention to what he called the formidable research accomplishments and exceptional scientific leadership of the Navy diving medical officers themselves. He then emphasized the extensive international gains that have resulted from individual research by naval or civilian scientists and urged that the opportunity for naval biomedical research training in the university be actively continued. He cited the critical importance of mutual support by federal, university, and industrial organizations having interests in undersea work of many forms. He promised continued efforts by the Institute for Environmental Medicine to increase the scope and safety of diving and related undersea activities.

The award itself is a classic Navy Mark 5 deep sea diving helmet which has been in continuous diving use since its manufacture in 1942. During World War II it had been part of the equipment of a salvage team operating in Guam. A fixture of Navy diving for over 60 years, the copper Mark 5 helmet may soon become a working relic like the DC-3 when the Navy introduces its replacement, the modern design fiberglass Mark 12 helmet into the fleet.

Lambertsen and the Institute staff were also recognized by the Aerospace Medical Association in its 1979 annual meeting in Washington, D.C. The Environmental Science Award was awarded to Lambertsen for the research study entitled "Human Tolerance to He, Ne, and N_2 at Respiratory Gas Densities Equivalent to He-0_2 Breathing at Depths to 1,200, 2,000, 3,000, 4,000 and 5,000 Feet of Sea Water (Predictive Studies III)."

NOTES & ANNOUNCEMENTS

MSC TRAINING COURSES AVAILABLE

The Army and Air Force courses listed below are open for Navy Medical Service Corps and Medical Corps officers of the appropriate specialties. Applications must be submitted in accordance with BUMEDINST 4651.1B and received at the Naval Health Sciences Education and Training Command at least six weeks before the course date to assure availability of the limited quotas.

For further information, contact: LT D.M. McGann, MSC, USN, Director, Medical Service Corps Programs, Naval Health Sciences Education and Training Command (Code 6), National Naval Medical Center, Bethesda, Md. 20014. Telephone: Autovon 295-0624, Commercial (202) 295-0624.

ARMY COURSES

Army Podiatry Seminar
Walter Reed AMC
Washington, D.C.
25-28 Feb 1980

Laser-Microwave Hazards Workshop
USA Environmental Hygiene Agency
Aberdeen Proving Grounds, Md.
16-21 March 1980

Nuclear Pharmacy Orientation
Letterman AMC
San Francisco, Calif.
16-28 March 1980

Administration for Hospital Food Service
Academy of Health Sciences
U.S. Army
Fort Sam Houston, Tex.
30 March-4 April 1980

Health Care Administration Executive Symposium
Academy of Health Sciences
U.S. Army
Fort Sam Houston, Tex.
6-11 April 1980

Health Care Logistic Management
Fitzsimmons AMC
Aurora, Colo.
6-11 April 1980

Musculoskeletal Assessments for Physical Therapy Officers
Academy of Health Sciences
U.S. Army
Fort Sam Houston, Tex.
6-18 April 1980

Pathology and Laboratory Symposium
Walter Reed AMC
Washington, D.C.
20-25 April 1980

Army Pharmaceutical Service Management
Walter Reed AMC
Washington, D.C.
18-23 May 1980

Occupational Health Workshop
USA Environmental Hygiene Agency
Aberdeen Proving Grounds, Md.
1-6 June 1980

Military Optometry
Fitzsimmons AMC
Aurora, Colo.
14-19 Sept 1980

AIR FORCE COURSES

Medical Aspects of Advanced Warfare (0-4 and above, SECRET Clearance)
Brooks AFB, Tex.
28 Jan-1 Feb 1980

Laser Hazard Assessment
Brooks AFB, Tex.
4-8 Feb 1980

Industrial Hygiene Measurements
Brooks AFB, Tex.
13-27 Feb 1980, 2-13 June 1980, 14-25 July 1980

Physical Therapy (Advanced)
Wilford Hall USAF Medical Center
San Antonio, Tex.
3-21 March 1980

Medical Food Service Management for Dieticians
Brooks AFB, Tex.
21-25 April 1980

Physical and Occupational Therapy Management
Wilford Hall USAF Medical Center
San Antonio, Tex.
28 April-2 May 1980

Pharmacy Seminar
Brooks AFB, Tex.
20-22 May 1980

Behavioral Sciences Symposium
Brooks AFB, Tex.
28-30 May 1980

Operational Problems with Aerospace Physiology
Brooks AFB, Tex.
2-6 June 1980

A Podiatric Blunt Dissection Technique for Plantar Wart Removal

LT Ronald A. Warcholak, MSC, USN

Recently, medical literature articles have appeared proclaiming the advantages of blunt dissection of plantar warts or verrucae. It is the purpose of this paper to present a podiatric office technique that I have used for over 10 years and to show how it is particularly suited to the feet of active duty military personnel. Because healing results in no scar formation, blunt dissection is ideally suited to the sole of the foot.

Diagnosis

It is extremely important to make an accurate diagnosis of a plantar wart as there are several lesions appearing on the plantar surface of the foot which resemble warts. The intractable plantar keratoma (IPK) is the most common lesion which resembles a wart on the sole of the foot. These lesions are the result of excessive weight-bearing on a plantar displaced metatarsal head. All attempts to eradicate these IPKs, as they are commonly called, utilizing wart therapy will prove futile. IPKs are the result of a biomechanical disturbance while warts have a viral etiology.

Porokeratotic lesions are another entity found on the sole of the foot, especially the heel, which are often misdiagnosed as plantar warts. These lesions are simply referred to as plugged sweat glands as this name accurately describes them. They resemble small plugs of hyperkeratotic tissue surrounded by a whitish rim. Porokeratotic lesions are found over weight-bearing areas of the foot and can be extremely painful when the patient is ambulating.(*1*)

Seed corns or heloma miliare are another dermatological entity found on the plantar surface of the foot. They may at times be confused with small plantar warts. Heloma milliare are usually very tiny, clear in character, and resemble small seeds of callous tissue. They are often found embedded in a hyperkeratotic depression on the sole of the foot. Often they may be quite numerous and give the sensation to the patient of walking on particles of sand.(*2*)

One may reasonably diagnose a plantar wart if the following criteria are met:

- Plantar warts tend not to be found over bony prominences, metatarsal heads in particular. Warts are caused by viral invasion and are not the result of excessive pressure or a biomechanical abnormality. If a similar lesion appears in exactly the same location on both feet, it is more reasonable to diagnose a biomechanical problem than a plantar wart.
- Plantar warts are very vascular and consequently bleed very easily when cut. The common misconception that warts have seeds is erroneous. What appears to be tiny black seeds are actually tiny capillaries. Take a scalpel blade and remove the superficial skin covering the wart and you will see small bleeding points coming from the cut capillary tips. This is an accurate indication that the lesion is most probably a wart. (Figure 1)
- Plantar warts are more painful when squeezed. Intractable plantar keratomas (IPKs) are more painful when direct finger pressure is applied to them.
- Plantar warts have a distinct line of demarcation from the surrounding healthy tissue in which they are imbedded. The capillary tips are located in the center and are perpendicular to the skin. The IPKs and seed corns will have the normal papillary skin lines running parallel across their crystalline hyperkeratotic centers.

Blunt Dissection Technique

The technique is simple and one can become quite adept at it with just a little practice. Remember, stay in

LT Warcholak is the podiatrist at NRMC Camp Lejeune, N.C. 28542.

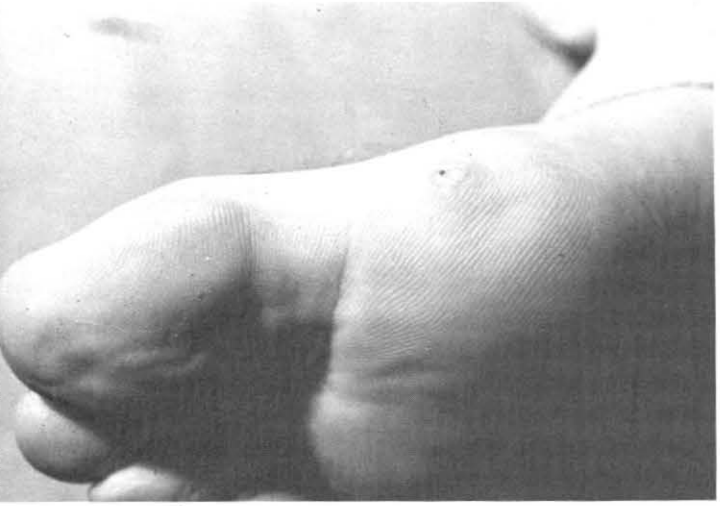


FIGURE 1

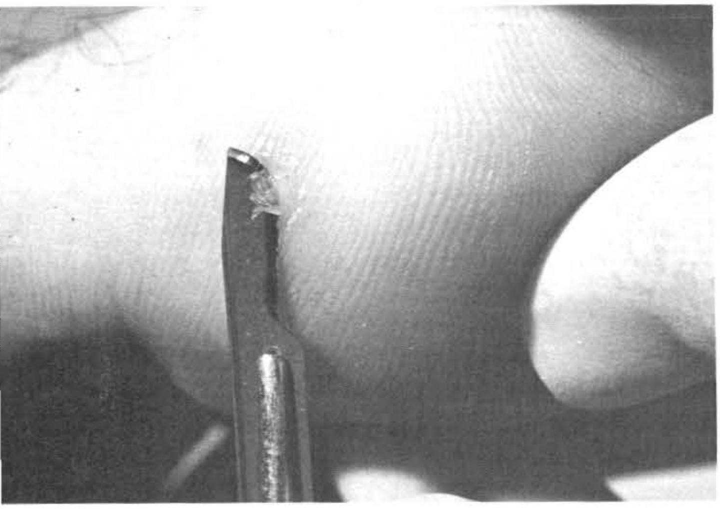
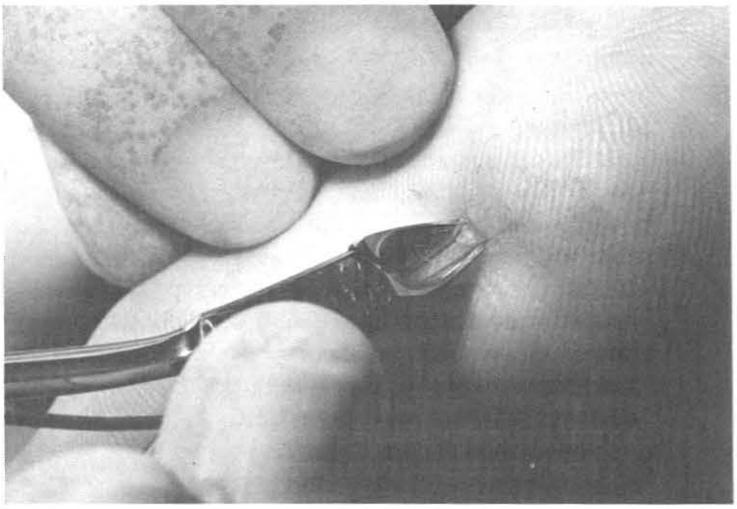


FIGURE 2



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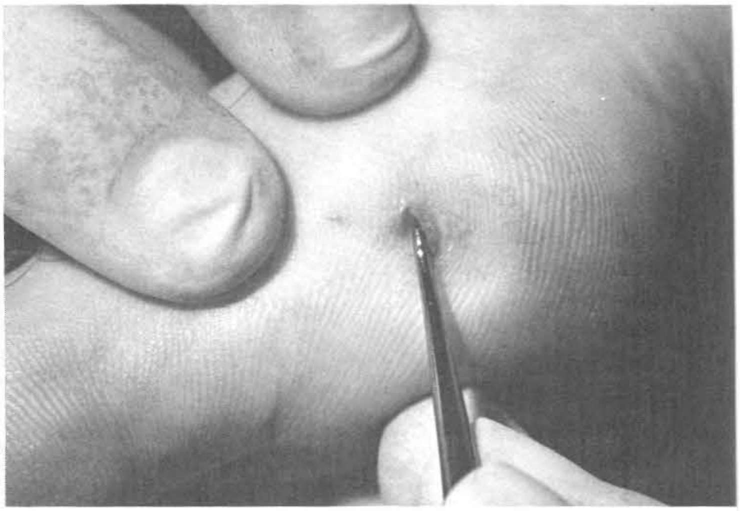

FIGURE 4

the skin layer. Do not penetrate into the fatty tissue. This is the essence of the technique.

1. Infiltrate about the wart with a local anesthetic. We routinely use 2 percent Lidocaine (Xylocaine®) with 1:100,000 Epinephrine. However, any local anesthetic may be used even without the use of a vasoconstrictor. For safety, if a wart is located on a toe, the digit should be blocked without the use of a vasoconstrictor. A small tourniquet can be placed about the toe to achieve hemostasis if so desired. It is, of course, removed after the wart is removed.

2. Scrub the foot with a surgical soap and paint with an antiseptic. Five sterile instruments are used—a No. 150 tissue forceps with convex jaws, a No. 51 soft corn spoon, a No. 4714 size 2 bone currette, a thumb forceps, and a scalpel with a No. 10 blade.

3. Use a scalpel handle fitted with a No. 10 blade to remove the superficial covering of the wart. Often the wart will appear larger than was originally thought. The outline of the wart should now be quite clearly delineated. (Figure 2)

4. A curved tissue nipper is now used to make a small nick on the periphery of the wart so that the instrument can be inserted at the outermost edge of the wart. (Figure 3)

5. Take the soft corn excavator and insert it into the nick at the periphery of the wart. Begin now to separate the wart from the surrounding tissue. A drawing, pulling action is used much like trying to separate a raisin from a slice of raisin bread. Be careful to stay in the skin layer. Do not puncture the deeper fascial layer because scarring will occur. If care is used, one should see the white tissue of the wart capsule which separates

the bottom of the wart from the deeper tissues. Very little bleeding should result from this dissection whether or not a vasoconstrictor was used in the local anesthetic.

6. Bluntly dissect the wart away from the surrounding tissue as thoroughly as possible. Now cut the wart away from the small skin tab which may still bind the wart if it remains attached. (Figures 4 and 5)

7. With the small bone currette, scrap the resulting concavity clean of all verrucous tissue. (Figure 6)

8. With the curved tissue nipper cut or bevel the edge of the concavity. This will allow for smooth filling of the wart with granulation tissue.

9. Place an antibiotic cream inside the wound. Apply a nonadherent pad over the wound cavity. This is followed by a bulky dry sterile dressing. The patient should be advised that some bleeding may later be

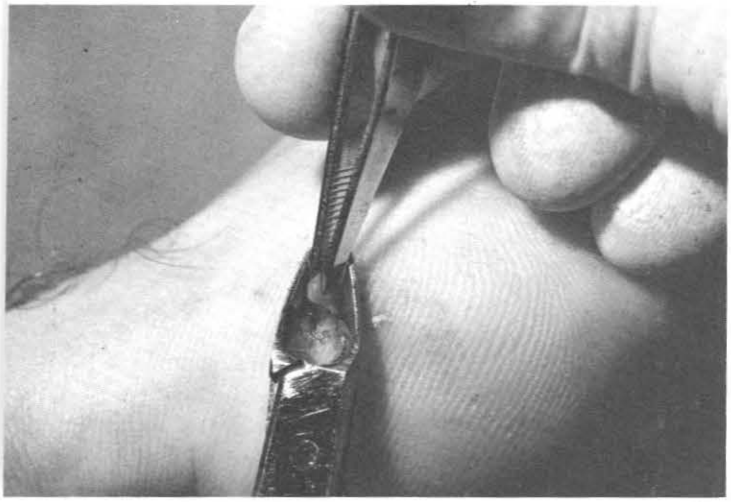

FIGURE 5

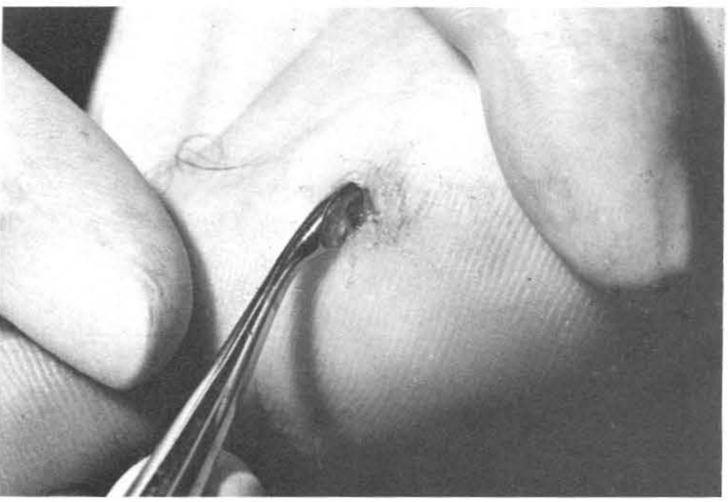

FIGURE 6

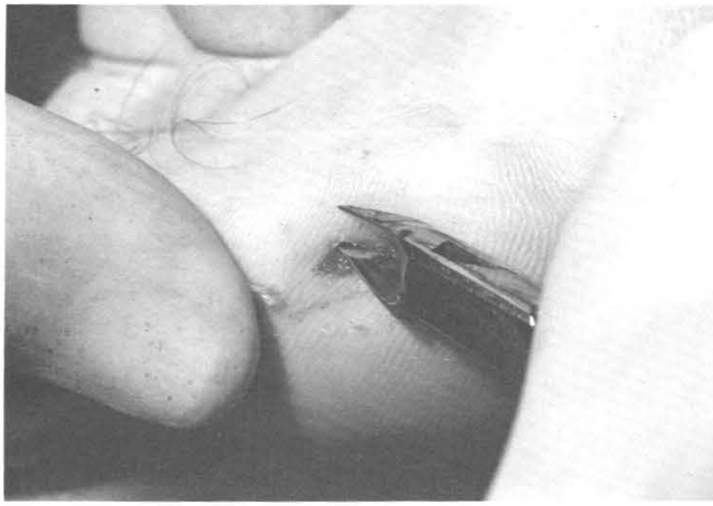

FIGURE 7

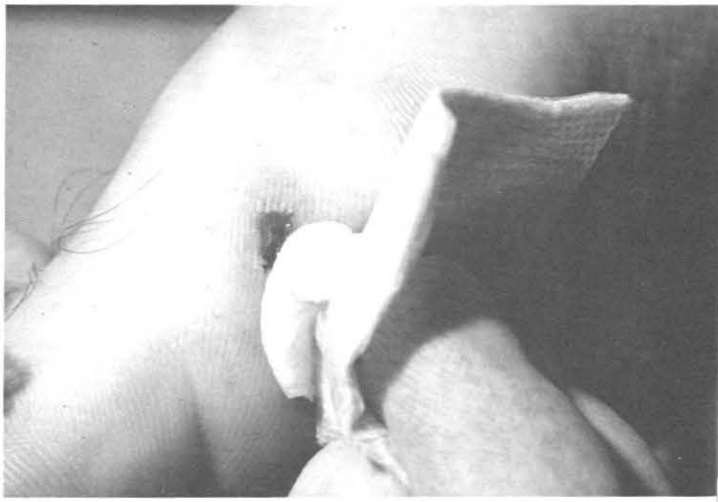

FIGURE 8

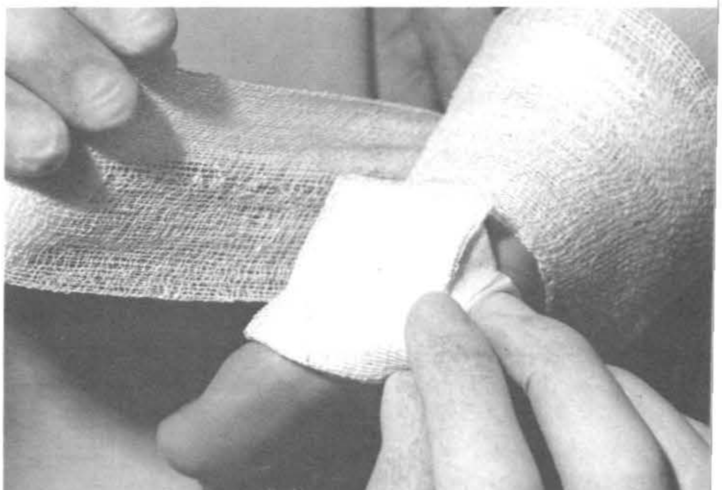

FIGURE 9

noted on the bandage but that this is no cause for alarm. (Figures 7-9)

Conclusion

There is virtually no postoperative pain and most patients require no analgesic medication. Those that do, however, find relief with mild nonnarcotic analgesic.

Postoperative infection with this technique is virtually nonexistent. The absence of post-surgical infection may be due to the small amount of cleansing hemmorhage from the wound the first few hours after excision.

Healing time is very rapid, averaging from 8 to 10 days. We see the patient three times, postoperatively, usually on the fourth, tenth, and fourteenth day. Most military personnel can be returned to full duty on or about the tenth postoperative day.

This procedure can easily be accomplished in the doctor's office in approximately 20 minutes. To facilitate the procedure, we keep sterilized wart instrument kits available at all times.

Although I did not originate this technique, I have used it on countless Navy and Marine personnel at Camp Lejeune, N.C., and have experienced no difficulties whatever. I believe, wholeheartedly, that this is the procedure of choice for surgical removal of plantar warts, as healing occurs without painful scar formation on the sole of the foot.

Statistics are unavailable but the reoccurrence rate appears to be minimal.

References

1. Yale I: *Podiatric Medicine.* Baltimore, Williams & Wilkins Co, 1974, pp 122-123.
2. Charlesworth F: *Chiropdy, Theory and Practice,* ed 5. London, Actinic Press, Ltd, 1961, p 38.

Simple Solution to a Chronic Problem

Often by the time a pharmacy receives mannitol injection 25 percent, crystallization has already occurred in the ampule. This presents the hospital pharmacist with a small problem. One can follow directions from the manufacturer and make a hot water bath(*1*) in which to immerse the ampules and then store them on the shelf only to find that the solution has again precipitated.

There is a simple solution to this common problem. Methodist Hospital in Memphis, Tenn., uses a styrofoam cooler with a low wattage incandescent bulb to store and keep mannitol injection 25 percent from crystallizing.

Shortly after coming to NNMC Bethesda, Md., I obtained a small cooler (16 x 10 x 9 inches) and had a 15 watt bulb installed. The cooler maintains a constant temperature of 35°C. Using the manufacturer's suggested method as stated in the package insert, the solution must be allowed to cool to body temperature prior to use. The cooler temperature is already very close to body temperature, thereby saving considerable time in preparing the ampules for use.

One other method used to redissolve mannitol is autoclaving. I mention this to show that the temperature I advocate will in no way harm the solution. A study was undertaken in 1975 by Muty and Kapoor to determine the effects of repeated autoclavings on mannitol.(*2*) They used temperatures at 250°F for 15 minutes and subjected each ampule at least five times. They found no presence of particles from the rubber stoppers and no change in chemical or physical properties of the solution.

We have been using this method for three months now and have had no problems.

The total cost of the "Hot Box" is about $10. We are now considering placing one "Hot Box" on each nursing station.

References

1. Mannitol Injection, Merck, Sharp and Dohme, Package insert, March 1976.
2. Murty R, Kapoor JN: Properties of Mannitol Injection (25%) After Repeated Autoclavings. *Am J Hosp Pharm* 32:826-827, Aug 1975.

—LTJG Charles F. Hostettler, MSC, USNR, Pharmacy Staff, NNMC Bethesda, Md.

Occupational Lung Disease

CAPT T.V. McManamon, MC, USN

The human pulmonary biosystem has apparently adapted very well to the terrestrial atmospheric environment of the earth over the past 4 million years. Beginning with the industrial revolution, there has been a logarithmic escalation of atmospheric pollution. The various life forms on this planet are now having to pay the price for previous industrial progress.

Even though they are anatomically interiorized and uniquely protected by the thoracic cage and guarded by efficient defense mechanisms such as the mucociliary escalator, the human lungs are the main interface between the human biosystem and the occupational environment. Atmospheric contaminants such as infectious, toxic, carcinogenic, and sensitizing agents cause most of the occupational pulmonary diseases. To be able to evoke a pathological pulmonary response, these contaminants must be able to bypass the various defense mechanisms of the tracheobronchial tree and be able to reach the lower respiratory tract. The specific toxin must then be deposited or absorbed on various bronchial or alveolar surfaces. In addition to deposition, there must be sufficient residual time for the toxin to be in contact with the alveolar surface for it to elicit a pathological response. Although the pathological response can be very prompt, it more characteristically takes years or even decades for an atmospheric toxin to provoke a recognizable clinical syndrome. Similar to other human organ systems, the tissues of the respiratory tract can react to multiple insults with only a limited number of responses. Many harmful pulmonary agents can produce a biphasic pathological result, including an acute response that may be clinically manifested for up to 24 hours after the initial exposure and a chronic effect that may be delayed for months or years.

There is an increasing accumulation of evidence suggesting that many occupational lung diseases are manifestations of adverse immunological mechanisms. Characteristics of the end stages of beryllium, asbestos, and progressive massive fibrosis of coal workers pneumoconioses are consistent with delayed hypersensitivity type of immunological mechanisms. It is also of interest that many young adult female patients with chronic beryllium disease began their fatal clinical course only after the onset of their pregnancies, which in many ways represents a temporary, partial immunosuppressive state.

The occurrence of many occupationally related bronchogenic carcinomas seems to correlate well with the patient's age and decreased levels of immune efficiency. Even though some authorities feel that the increasing incidence of lung cancer (78,000 lung cancer deaths in 1977) appears to be the result of increasing atmospheric pollution in our environment, a more factual analysis of the data would incriminate cigarette smoking as the primary etiological agent. Also, the anticipated or predicted increase in case loads of other forms of specific occupational lung diseases in the general working population is not appearing at this time. Certainly, in industrial communities that are economically dependent on a specific hazardous material such as asbestos, uranium ore, and coal, the incidence of recognizable pulmonary pathology can be higher than in a comparable population group.

The employed military and civilian populations in the United States are very mobile groups, both geographically and employmentwise. Exposure to occupational pulmonary hazards for even those individuals who remain with a single employer for a sufficient period of time to eventually qualify for retirement benefits can be extremely variable. Under one employer, many workers change job exposures frequently as new products or processes are developed, as new plants are built, or as old plants are modified and changes in plant ventilation or layout occur. As a result of these alterations, a specific worker can be exposed to varying concentrations and types of atmospheric contaminants during his working years. As an example, a manufacturer may sequentially utilize asbestos fibers, then at a later date, switch to fiberglass fibers, and eventually a plastic polymer substitute, while producing what appears to the consumer to be the same end product.

Because freedom and fluidity of occupational career patterns are evident in the United States, many individuals who are adversely affected by one or more deleterious aspects of a work environment often voluntarily drop out of that particular worker population. The individual worker may decide to quit a job because he does not like the smell or dust, or because he feels "choked up" whenever he works. These workers flow to more compatible occupational environments, leaving those who are not bothered by these factors or who are willing to tolerate them for other reasons. In this latter group of long-term employees, the highest incidence of occupational lung disease should be found. However, in

From the Environmental Health Service and Clinical Investigation Center, NRMC San Diego, Calif. Supported in part by BUMED Clinical Investigation Program.

those employees who persist in work situations with hazardous agents, many may be genetically endowed to resist the adverse respiratory effects of the individual or combined toxic materials. This tolerance to the deleterious effects of particular hazardous agents permits them to retire unscathed as "surviving veterans." They should not be considered as truly representative of the total exposed population. Thus, the old Chief Petty Officer who states, "I have been working with asbestos for 20 years and it hasn't hurt me a bit," may be speaking factually for himself but not necessarily for many other less fortunate naval personnel.

The approximately 70 square meters of alveolar surface is roughly equivalent to the area of a tennis court. Affecting this extensive surface are those atmospheric contents that evade all of the various, marvelous defense mechanisms of the respiratory system. Most occupational pulmonary hazards can produce clinical manifestations after a long latent period as in the case with asbestos. Most individuals continuously exposed to high concentrations of respirable asbestos dust usually do not demonstrate any recognizable pulmonary abnormality symptomatically or on physical examination before seven years after initial exposure. Clinically, the interstitial pulmonary fibrosis of asbestos is not different from that of other causes and does not generally manifest itself until 10 to 15 years after initial exposure. The latent period of invasive malignant mesothelioma secondary to asbestos exposure may be up to 30 or even 40 years following initial exposure. Obviously, some workers prone to develop mesothelioma die from other causes before the mesothelioma appears. Similarly, asbestosis related bronchogenic carcinomas may take eight years before the initial roentenographic or cytologic manifestations are recognizable by the clinician. There are some indications that cigarette smoking, in addition to perhaps acting as a carcinogen for various occupationally related bronchogenic carcinomas, may actively shorten the usual latent periods for some of the occupationally induced pulmonary interstitial fibroses (e.g., beryllium).

Many occupational toxins interfere with basic enzymatic biosystems such as heavy-metal poisoning of sulfhydril groups which can initially produce diffuse and nonspecific biological effects. These effects usually are not evident to the patient or clinically identifiable by the physician until sufficient distortion of the patient's biosystem has resulted. Frequently, it is the epidemiologic aspects of occupational lung disease that force us to recognize its existence. Our current level of diagnostic sensitivity may not be sophisticated enough to recognize a pulmonary occupational poisoning very early in its clinical course. Similarly, an employee with nonspecific changes on his annual chest x-ray or pulmonary function test can have these changes temporarily explained by aging, smoking, or other factors so that the underlying occupational toxin remains unidentified for a considerable period of time.

Each employee ventilates a theoretical tidal volume of 250 cc per breath which equates to four liters per minute or 2 million cc of air per eight-hour shift. The allowable concentration of asbestos by the current OSHA standard is two asbestos fibers per cc of respirable air. Therefore, at the present time, all employees are permitted to inhale approximately 4 million cc asbestos fibers greater than 5 mm in length each working day. Because of the inherent structural characteristics of many naval vessels, the respiratory tract of embarked naval personnel can be exposed to various atmospheric contaminants such as asbestos dust on a 24-hour basis in contrast to the usual eight-hour exposure of shore-based facilities. Such factors deserve serious consideration in the medical evaluation of embarked naval personnel and especially in the design of future naval vessels. For all practical purposes, the permitted exposure to asbestos dust is being reduced to 0.5 fiber per cc of respirable air. Also, the number of asbestos fibers that reach the alveolar surface is extremely variable.

The alveolar surfaces are in the main portal of entry for airborne substances both beneficial as well as detrimental. Many toxins are able to affect other organ systems after their absorption via the alveolar surface into the main circulation of blood. Some of these agents are carcinogenic for the lung or other organ systems; some toxins are teratogenic during the organogenesis stages of the undetected fetus. All may occur in the work environment of employed pregnant females. Of greater significance are those substances that carry the potential to be mutagenic because they will not manifest their adverse effects for several generations, will affect both sexes, and will not be identified until damage is done to succeeding generations.

Occupational lung diseases are unique in that they are all man-made diseases. They are, therefore, all preventable. In those industrial settings where adequate engineering or industrial hygiene precautions have been implemented, there has been a dramatic and documentable decline in occupational lung diseases. Since it takes so long to clinically recognize occupational lung diseases and there is very little we can do therapeutically for victims, the only acceptable approach is to prevent them in an effort to permit current and future generations to live out their normal life expectancy free from the man-made hazards of occupational atmospheric contaminants.

BUMED SITREP

EFFECTIVE DATES ON VARIABLE INCENTIVE PAY (VIP) CONTRACTS

Four dates appear on the Variable Incentive Pay (VIP) Contract (NAVMED 7220/3 (7-77) NAVCOMPT Form 2259 (7-77)) above contract: (1) Date of Eligibility —Section B of the Form which is filled in by the Bureau of Medicine and Surgery; (2) Date of Acceptance—Section C of the Form which is the date the officer signs and dates the contract; (3) Effective Date—Section D of the Form which is filled in by the administrative/personnel office and is either the eligibility date or the acceptance date; and (4) Date of the Commanding Officer's Signature—Section D of the Form which is the date the commanding officer (or designated representative) signs the contract. The *effective date* for the Variable Incentive Pay is the *eligibility date,* or the *acceptance date* (if that date is more than 30 days subsequent to the eligibility date). The *effective date* is very important because it determines the year in which the VIP income is earned and the tax withholding is reported on the W-2. Problems have occurred because: (1) medical officers have signed a contract which created an acceptance date in one year and then presented the contract to the disbursing officer for payment in another year (usually the reason given for this is that the commanding officer wasn't available to sign the contract until the later date or that the officer concerned did not desire to be taxed in the year he signed the acceptance); and (2) the eligibility date was late in the year and the acceptance date was early in the next year, but since there were less than 30 days between the two dates, the earlier eligibility date became the effective date. The result of both of these situations is that the VIP payment is included in the officer's earned income and tax withheld for the year of the effective date vice the year the payment is made to the officer. The Judge Advocate General of the Navy has consistently ruled the money is available to the officer on the *effective date.* Recognizing that the medical officer may not be able to obtain his commanding officer's signature on the document the same day he signs his acceptance of the contract, procedures which required this are being revised to insure that an administrative/personnel officer or other person authorized to sign pay-related documents signs the document either the same day as the member signs the contract or at least within the same fiscal year as the effective date. Medical officers accepting contracts in October, November, or December will be taxed in that year even if they do not present the document to the disbursing officer for payment until the following year. Also, for any contracts accepted in January, when such acceptance date is less than 30 days from an eligibility date in December, the officer will be taxed in the prior year because it is the year of the effective date. Medical officers who plan to negotiate a contract during the last few months of a year or at the beginning of a year should seek advice from their disbursing officer on how this action will affect their tax liability. If an officer does not desire to be taxed in a certain year, then he/she should delay his/her signing of the acceptance of the contract for a period of time which insures that the income and tax will be reported in the following year. Also, once the effective date is established, this date becomes the beginning date of the active duty agreement (VIP Contract) as well as the anniversary date for future installments of VIP. If an officer fails to complete the total number of years of active duty specified in the agreement (VIP Contract) for any of the reasons listed in paragraph 10526 of the DODPM, recoupment of appropriate portion of the variable incentive pay will be required.

U.S. ARMY-BAYLOR UNIVERSITY GRADUATE PROGRAM ADMISSION AVAILABLE TO NAVY NURSE CORPS

Navy Nurse Corps officers are now invited to apply for the U.S. Army-Baylor University Graduate Program in Health Care Administration. This program leads to a Master of Health Administration degree.

Prerequisites include a composite GRE score of 1,000 and prior completion of courses in economics, accounting, and/or finance and statistics. Reference BUMEDINST 1520.14E for guidance. Applications must be in HSETC (Code 7) no later than 15 Feb 1979 for consideration for the Fall 1980 class.

The program brochure is available from: Director, U.S. Army-Baylor University Graduate Program in Health Care Administration, Academy of Health Sciences, U.S. Army, Fort Sam Houston, Texas 78234.

For further information contact CDR F.C. McKown, NC, USN, Autovon 295-0630.

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NOTE: Figures indicate the issue and page in Volume 70 of *U.S. Navy Medicine.* For example, 12:12 indicates that the article may be found in Volume 70, No. 12, page 12.

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